Abstract

The invention relates to plant transcription factor polypeptides, polynucleotides that encode them, homologs from a variety of plant species, and methods of using the polynucleotides and polypeptides to produce transgenic plants having advantageous properties compared to a reference plant. Sequence information related to these polynucleotides and polypeptides can also be used in bioinformatic search methods and is also disclosed.

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SEQUENCE LISTING

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<150> MBI-0022
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<150> 09/837944
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    130                 135                 140

gaa gct ctc aac act act cct cct cct cct cct tct cat cct cac gct      480
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Ser Met Lys Arg Met Gly Tyr Asn Arg Asn Ala Lys Arg Cys Lys Glu
225                 230                 235                 240

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gga aag ttt gca gca gag att cga gac ccg tcg aga aac ggt gcc cgt      208
Gly Lys Phe Ala Ala Glu Ile Arg Asp Pro Ser Arg Asn Gly Ala Arg
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Leu Trp Leu Gly Thr Phe Glu Thr Ala Glu Glu Ala Ala Arg Ala Tyr
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Pro Asn Glu Tyr Tyr Pro Arg Met Asp Asp Tyr Ser Leu Arg Pro Pro
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Tyr Ala Ser Ser Ser Ser Ser Ser Ser Ser Gly Ser Thr Ser Thr Asn
95 100 105

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gat aag gtt ctt gaa gaa ctt ctt gat tca gaa gaa agg aag aga taa 496
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125 130 135

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Ser Ala Thr Gly Lys Leu Ser Glu Phe Cys Ser Glu Gln Asn Arg Met
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Pro Gln Leu Ile Asp Arg Tyr Leu His Thr Asn Gly Leu Arg Leu Pro
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Tyr Gln Gln Phe Ile Glu Gln Leu Gln Cys Tyr Lys Pro Gly Glu Tyr
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Gln Gln Phe Leu Glu Gln Gln Gln Gln Gln Pro Asn Ser Val Leu Gln
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            50                  55                  60

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95                  100                 105                 110

acc ggg aag ctc tca tca gta cct tct gat aag gct aaa gct gag tta      806
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                115                 120                 125

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Phe Asp Asp Ile Thr Thr Ser Leu Ala Phe Gln Thr Ile Ser Gly Ser
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Tyr Glu Glu Arg Gln Leu Gly Gly Leu Gly Asp Ser Met Ala Cys Cys
    160                 165                 170

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            210                 215                 220

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255                 260                 265                 270

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    320                 325                 330

gaa tca aag aga agg aaa cta gaa gct tat gca aca gaa acg agt gga     1478
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335                 340                 345                 350

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Lys Val Val Lys Gly Asn Pro Asn Pro Arg Ser Tyr Tyr Lys Cys Thr
        385                 390                 395

gct aat gga tgt acc gta acg aag cat gta gag aga gcc tct gat gac     1670
Ala Asn Gly Cys Thr Val Thr Lys His Val Glu Arg Ala Ser Asp Asp
    400                 405                 410

ttc aag agc gta cta aca act tat ata ggc aag cac acc cac gtt gta     1718
Phe Lys Ser Val Leu Thr Thr Tyr Ile Gly Lys His Thr His Val Val
415                 420                 425                 430

cca gca gca cgc aac agc agc cac gtc ggt gca ggc agt tca ggg act     1766
Pro Ala Ala Arg Asn Ser Ser His Val Gly Ala Gly Ser Ser Gly Thr
                435                 440                 445

ctc caa ggc agt tta gcg act cag acc cac aac cac aat gtg cac tat     1814
Leu Gln Gly Ser Leu Ala Thr Gln Thr His Asn His Asn Val His Tyr
            450                 455                 460

cca atg cca cac agt aga tct gag gga ctg gcc aca gcc aac tca tct     1862
Pro Met Pro His Ser Arg Ser Glu Gly Leu Ala Thr Ala Asn Ser Ser
        465                 470                 475
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cta ttt gac ttc cag tca cac ctg agg cat cct aca ggt ttc tcc gtt 1910
Leu Phe Asp Phe Gln Ser His Leu Arg His Pro Thr Gly Phe Ser Val
480 485 490

tac ata ggc caa tct gag ctt tct gat ctt tca atg cct ggt cta act 1958
Tyr Ile Gly Gln Ser Glu Leu Ser Asp Leu Ser Met Pro Gly Leu Thr
495 500 505 510

att ggg caa gag aag ctt acc agc ctg cag gcg cct gac att ggg gat 2006
Ile Gly Gln Glu Lys Leu Thr Ser Leu Gln Ala Pro Asp Ile Gly Asp
515 520 525

cca act ggc cta atg ttg cag tta gca gca cag ccg aag gtg gaa cca 2054
Pro Thr Gly Leu Met Leu Gln Leu Ala Ala Gln Pro Lys Val Glu Pro
530 535 540

gtg tca cca caa cag gga ctt gat ttg tca gcg agc tca ttg ata tgc 2102
Val Ser Pro Gln Gln Gly Leu Asp Leu Ser Ala Ser Ser Leu Ile Cys
545 550 555

aga gag atg ttg agt aga tta cga cag ata tga aacaaatctc tttgttcact 2155
Arg Glu Met Leu Ser Arg Leu Arg Gln Ile
560 565

gattgctcaa atttttgaat aaatgaaaaa ttgagaaaaa aaaaaaaaaa aaaaaaaaaa 2215

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Met Ala Gly Ile Asp Asn Lys Ala Ala Val Met Gly Glu Trp Phe Asp
1 5 10 15

Cys Ser Thr Thr Asn His Arg Lys Arg Ser Lys Ala Glu Leu Gly Arg
20 25 30

Glu Phe Ser Leu Asn Tyr Ile Lys Asn Glu Asp Ser Leu Gln Thr Thr
35 40 45

Phe Gln Glu Ser Ser Arg Gly Ala Leu Arg Glu Arg Ile Ala Ala Arg
50 55 60

Ser Gly Phe Asn Ala Pro Trp Leu Asn Thr Glu Asp Ile Leu Gln Ser
65 70 75 80

Lys Ser Leu Thr Ile Ser Ser Pro Gly Leu Ser Pro Ala Thr Leu Leu
85 90 95

Glu Ser Pro Val Phe Leu Ser Asn Pro Leu Leu Ser Pro Thr Thr Gly
100 105 110

Lys Leu Ser Ser Val Pro Ser Asp Lys Ala Lys Ala Glu Leu Phe Asp
115 120 125

Asp Ile Thr Thr Ser Leu Ala Phe Gln Thr Ile Ser Gly Ser Gly Leu
130 135 140

Asp Pro Thr Asn Ile Ala Leu Glu Pro Asp Asp Ser Gln Asp Tyr Glu
145 150 155 160

Glu Arg Gln Leu Gly Gly Leu Gly Asp Ser Met Ala Cys Cys Ala Pro
165 170 175

Ala Asp Asp Gly Tyr Asn Trp Arg Lys Tyr Gly Gln Lys Leu Val Lys
180 185 190

Gly Ser Glu Tyr Pro Arg Ser Tyr Tyr Lys Cys Thr His Pro Asn Cys
195 200 205

Glu Ala Lys Lys Lys Val Glu Arg Ser Arg Glu Gly His Ile Ile Glu
210 215 220

Ile Ile Tyr Thr Gly Asp His Ile His Ser Lys Pro Pro Pro Asn Arg
225 230 235 240

Arg Ser Gly Ile Gly Ser Ser Gly Thr Gly Gln Asp Met Gln Ile Asp
245 250 255

Ala Thr Glu Tyr Glu Gly Phe Ala Gly Thr Asn Glu Asn Ile Glu Trp
260 265 270

Thr Ser Pro Val Ser Ala Glu Leu Glu Tyr Gly Ser His Ser Gly Ser
275 280 285

Met Gln Val Gln Asn Gly Thr His Gln Phe Gly Tyr Gly Asp Ala Ala
290 295 300

Ala Asp Ala Leu Tyr Arg Asp Glu Asn Glu Asp Asp Arg Thr Ser His
305 310 315 320

Met Ser Val Ser Leu Thr Tyr Asp Gly Glu Val Glu Glu Ser Glu Ser
325 330 335

Lys Arg Arg Lys Leu Glu Ala Tyr Ala Thr Glu Thr Ser Gly Ser Thr
340 345 350

Arg Ala Ser Arg Glu Pro Arg Val Val Val Gln Thr Thr Ser Asp Ile
355 360 365

Asp Ile Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Val
370 375 380

Val Lys Gly Asn Pro Asn Pro Arg Ser Tyr Tyr Lys Cys Thr Ala Asn
385 390 395 400

Gly Cys Thr Val Thr Lys His Val Glu Arg Ala Ser Asp Asp Phe Lys
405 410 415

Ser Val Leu Thr Thr Tyr Ile Gly Lys His Thr His Val Val Pro Ala
420 425 430

Ala Arg Asn Ser Ser His Val Gly Ala Gly Ser Ser Gly Thr Leu Gln
435 440 445

Gly Ser Leu Ala Thr Gln Thr His Asn His Asn Val His Tyr Pro Met
450 455 460

Pro His Ser Arg Ser Glu Gly Leu Ala Thr Ala Asn Ser Ser Leu Phe
465 470 475 480

Asp Phe Gln Ser His Leu Arg His Pro Thr Gly Phe Ser Val Tyr Ile
485 490 495

Gly Gln Ser Glu Leu Ser Asp Leu Ser Met Pro Gly Leu Thr Ile Gly
500 505 510

Gln Glu Lys Leu Thr Ser Leu Gln Ala Pro Asp Ile Gly Asp Pro Thr
515 520 525

Gly Leu Met Leu Gln Leu Ala Ala Gln Pro Lys Val Glu Pro Val Ser
530 535 540

Pro Gln Gln Gly Leu Asp Leu Ser Ala Ser Ser Leu Ile Cys Arg Glu
545 550 555 560

Met Leu Ser Arg Leu Arg Gln Ile

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                                      Met Ala Val Glu Leu Met Thr
                                      1               5

cgg aat tac atc tcc ggc gtc gga gct gat agc ttc gcc gtt caa gaa      102
Arg Asn Tyr Ile Ser Gly Val Gly Ala Asp Ser Phe Ala Val Gln Glu
        10                  15                  20

gca gct gct tca gga ctc aaa agt atc gaa aat ttc atc ggt tta atg      150
Ala Ala Ala Ser Gly Leu Lys Ser Ile Glu Asn Phe Ile Gly Leu Met
    25                  30                  35

tct cgt gat agc ttt aac tct gat cag cca tct tct tct tcc gcc tcc      198
Ser Arg Asp Ser Phe Asn Ser Asp Gln Pro Ser Ser Ser Ser Ala Ser
40                  45                  50                  55

gcc tcc gcc tcc gcc gcc gca gat ctt gaa tca gct cgt aac aca acg      246
Ala Ser Ala Ser Ala Ala Ala Asp Leu Glu Ser Ala Arg Asn Thr Thr
                60                  65                  70

gcg gac gcg gct gtt tca aag ttt aaa aga gtc ata tct ctc tta gat      294
Ala Asp Ala Ala Val Ser Lys Phe Lys Arg Val Ile Ser Leu Leu Asp
            75                  80                  85

cga act cga acc gga cac gcc cgg ttt aga cgt gct ccg gtt cat gtt      342
Arg Thr Arg Thr Gly His Ala Arg Phe Arg Arg Ala Pro Val His Val
        90                  95                  100

att tct ccg gtt ctt tta caa gaa gaa cca aaa acg acg ccg ttt cag      390
Ile Ser Pro Val Leu Leu Gln Glu Glu Pro Lys Thr Thr Pro Phe Gln
    105                 110                 115

tct cct ctt cct cct ccg ccg caa atg atc cga aaa ggt tcg ttt tct      438
Ser Pro Leu Pro Pro Pro Pro Gln Met Ile Arg Lys Gly Ser Phe Ser
120                 125                 130                 135

tca tcg atg aaa acg att gat ttc tca tct ctc tcc tct gta aca acg      486
Ser Ser Met Lys Thr Ile Asp Phe Ser Ser Leu Ser Ser Val Thr Thr
                140                 145                 150

gaa tca gac aac cag aag aag att cat cat cat caa cgt ccc tct gaa      534
Glu Ser Asp Asn Gln Lys Lys Ile His His His Gln Arg Pro Ser Glu
            155                 160                 165

acg gcg ccg ttt gcg tct caa act caa agc ctc tcc acg acg gtc tcg      582
Thr Ala Pro Phe Ala Ser Gln Thr Gln Ser Leu Ser Thr Thr Val Ser
        170                 175                 180

tct ttc tca aaa tca aca aag aga aaa tgt aac tct gag aat ctt ctc      630
Ser Phe Ser Lys Ser Thr Lys Arg Lys Cys Asn Ser Glu Asn Leu Leu
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    185                 190                 195

acc gga aaa tgc gct tcc gct tct tcc tcc ggt cgt tgt cat tgc tcg      678
Thr Gly Lys Cys Ala Ser Ala Ser Ser Ser Gly Arg Cys His Cys Ser
200                 205                 210                 215

aag aaa aga aag ata aaa cag agg aga ata att agg gtt ccg gcg ata      726
Lys Lys Arg Lys Ile Lys Gln Arg Arg Ile Ile Arg Val Pro Ala Ile
                220                 225                 230

agt gca aaa atg tcc gat gta cca ccg gac gat tat tca tgg agg aaa      774
Ser Ala Lys Met Ser Asp Val Pro Pro Asp Asp Tyr Ser Trp Arg Lys
            235                 240                 245

tac gga caa aaa cca att aaa gga tct cca cat cca aga gga tat tat      822
Tyr Gly Gln Lys Pro Ile Lys Gly Ser Pro His Pro Arg Gly Tyr Tyr
        250                 255                 260

aag tgt agt agc gta aga ggt tgt cca gca cgt aaa cat gtt gag aga      870
Lys Cys Ser Ser Val Arg Gly Cys Pro Ala Arg Lys His Val Glu Arg
    265                 270                 275

gca gct gat gat tcg tcc atg ttg att gtt act tat gaa gga gat cat      918
Ala Ala Asp Asp Ser Ser Met Leu Ile Val Thr Tyr Glu Gly Asp His
280                 285                 290                 295

aat cat tct ctc tcc gcc gct gat ctc gcc gga gcc gcc gtt gct gat      966
Asn His Ser Leu Ser Ala Ala Asp Leu Ala Gly Ala Ala Val Ala Asp
                300                 305                 310

ctt att ttg gaa tcg tct tga aaagaacaaa tctttattta aggcttttat        1017
Leu Ile Leu Glu Ser Ser
            315

aatataaatt tagatcctta cttagtgaag tactcaaact atgaatgaaa tcaatgtaat   1077

caaaatcaaa aagcttttgc taaaaaaaaa aaaaaaaa                           1115
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Met Ala Val Glu Leu Met Thr Arg Asn Tyr Ile Ser Gly Val Gly Ala
1               5                   10                  15

Asp Ser Phe Ala Val Gln Glu Ala Ala Ala Ser Gly Leu Lys Ser Ile
            20                  25                  30

Glu Asn Phe Ile Gly Leu Met Ser Arg Asp Ser Phe Asn Ser Asp Gln
        35                  40                  45

Pro Ser Ser Ser Ser Ala Ser Ala Ser Ala Ser Ala Ala Ala Asp Leu
    50                  55                  60
```

Glu Ser Ala Arg Asn Thr Thr Ala Asp Ala Ala Val Ser Lys Phe Lys
65 70 75 80

Arg Val Ile Ser Leu Leu Asp Arg Thr Arg Thr Gly His Ala Arg Phe
85 90 95

Arg Arg Ala Pro Val His Val Ile Ser Pro Val Leu Leu Gln Glu Glu
100 105 110

Pro Lys Thr Thr Pro Phe Gln Ser Pro Leu Pro Pro Pro Pro Gln Met
115 120 125

Ile Arg Lys Gly Ser Phe Ser Ser Ser Met Lys Thr Ile Asp Phe Ser
130 135 140

Ser Leu Ser Ser Val Thr Thr Glu Ser Asp Asn Gln Lys Lys Ile His
145 150 155 160

His His Gln Arg Pro Ser Glu Thr Ala Pro Phe Ala Ser Gln Thr Gln
165 170 175

Ser Leu Ser Thr Thr Val Ser Ser Phe Ser Lys Ser Thr Lys Arg Lys
180 185 190

Cys Asn Ser Glu Asn Leu Leu Thr Gly Lys Cys Ala Ser Ala Ser Ser
195 200 205

Ser Gly Arg Cys His Cys Ser Lys Lys Arg Lys Ile Lys Gln Arg Arg
210 215 220

Ile Ile Arg Val Pro Ala Ile Ser Ala Lys Met Ser Asp Val Pro Pro
225 230 235 240

Asp Asp Tyr Ser Trp Arg Lys Tyr Gly Gln Lys Pro Ile Lys Gly Ser
245 250 255

Pro His Pro Arg Gly Tyr Tyr Lys Cys Ser Ser Val Arg Gly Cys Pro
260 265 270

Ala Arg Lys His Val Glu Arg Ala Ala Asp Asp Ser Ser Met Leu Ile
275 280 285

Val Thr Tyr Glu Gly Asp His Asn His Ser Leu Ser Ala Ala Asp Leu

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    290                 295                 300

Ala Gly Ala Ala Val Ala Asp Leu Ile Leu Glu Ser Ser
305                 310                 315


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aagttttaga ataatccgat aaaatacttt tatattaatt tttctttggt cc atg gag    118
                                                        Met Glu
                                                        1

ggt tcg tcc aaa ggg ttg agg aaa ggt gca tgg act gct gaa gaa gat      166
Gly Ser Ser Lys Gly Leu Arg Lys Gly Ala Trp Thr Ala Glu Glu Asp
        5                   10                  15

agt ctc ttg agg cta tgt att gat aag tat gga gaa ggc aaa tgg cat      214
Ser Leu Leu Arg Leu Cys Ile Asp Lys Tyr Gly Glu Gly Lys Trp His
    20                  25                  30

caa gtt cct ttg aga gct ggg cta aat cga tgc aga aag agt tgt aga      262
Gln Val Pro Leu Arg Ala Gly Leu Asn Arg Cys Arg Lys Ser Cys Arg
35                  40                  45                  50

cta aga tgg ttg aac tat ttg aag cca agt atc aag aga gga aga ctt      310
Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly Arg Leu
                55                  60                  65

agc aat gat gaa gtt gat ctt ctt ctt cgc ctt cat aag ctt cta gga      358
Ser Asn Asp Glu Val Asp Leu Leu Leu Arg Leu His Lys Leu Leu Gly
            70                  75                  80

aat agg tgg tcc ttg att gct ggt cga ttg cct ggt cgg acc gct aat      406
Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr Ala Asn
        85                  90                  95

gat gtc aaa aat tac tgg aac acc cat ctg agt aaa aaa cat gag tct      454
Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His Glu Ser
    100                 105                 110

tcg tgt tgt aag tct aaa atg aaa aag aaa aac att att tcc cct cct      502
Ser Cys Cys Lys Ser Lys Met Lys Lys Lys Asn Ile Ile Ser Pro Pro
115                 120                 125                 130

aca aca ccg gtc caa aaa atc ggt gtt ttt aag cct cga cct cga tcc      550
Thr Thr Pro Val Gln Lys Ile Gly Val Phe Lys Pro Arg Pro Arg Ser
                135                 140                 145

ttc tct gtt aac aat ggt tgc agc cat ctc aat ggt ctg cca gaa gtt      598
Phe Ser Val Asn Asn Gly Cys Ser His Leu Asn Gly Leu Pro Glu Val
            150                 155                 160
```

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gat tta att cct tca tgc ctt gga ctc aag aaa aat aat gtt tgt gaa      646
Asp Leu Ile Pro Ser Cys Leu Gly Leu Lys Lys Asn Asn Val Cys Glu
        165                 170                 175

aat agt atc aca tgt aac aaa gat gat gag aaa gat gat ttt gtg aat      694
Asn Ser Ile Thr Cys Asn Lys Asp Asp Glu Lys Asp Asp Phe Val Asn
    180                 185                 190

aat cta atg aat gga gat aat atg tgg ttg gag aat tta ctg ggg gaa      742
Asn Leu Met Asn Gly Asp Asn Met Trp Leu Glu Asn Leu Leu Gly Glu
195                 200                 205                 210

aac caa gaa gct gat gcg att gtt cct gaa gcg acg aca gct gaa cat      790
Asn Gln Glu Ala Asp Ala Ile Val Pro Glu Ala Thr Thr Ala Glu His
                215                 220                 225

ggg gcc act ttg gcg ttt gac gtt gag caa ctt tgg agt ctg ttt gat      838
Gly Ala Thr Leu Ala Phe Asp Val Glu Gln Leu Trp Ser Leu Phe Asp
            230                 235                 240

gga gag act gtt gaa ctt gat tag tgtttctcac cgtttgttta agattgtggg     892
Gly Glu Thr Val Glu Leu Asp
        245

tggcttttct ttcgtatttt agtaatgtat ttttctgtat gaagtaaaga atttcagcat    952

tttaagaaaa atggttatgt ttctacgtaa taaaaaaaaa cgttatttat aaaaaaaaaa   1012

aaaaaaaaaa aaaaaaaaaa a                                             1033
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Met Glu Gly Ser Ser Lys Gly Leu Arg Lys Gly Ala Trp Thr Ala Glu
1               5                   10                  15

Glu Asp Ser Leu Leu Arg Leu Cys Ile Asp Lys Tyr Gly Glu Gly Lys
            20                  25                  30

Trp His Gln Val Pro Leu Arg Ala Gly Leu Asn Arg Cys Arg Lys Ser
        35                  40                  45

Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
    50                  55                  60

Arg Leu Ser Asn Asp Glu Val Asp Leu Leu Leu Arg Leu His Lys Leu
65                  70                  75                  80

Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
                85                  90                  95
```

Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
100 105 110

Glu Ser Ser Cys Cys Lys Ser Lys Met Lys Lys Lys Asn Ile Ile Ser
115 120 125

Pro Pro Thr Thr Pro Val Gln Lys Ile Gly Val Phe Lys Pro Arg Pro
130 135 140

Arg Ser Phe Ser Val Asn Asn Gly Cys Ser His Leu Asn Gly Leu Pro
145 150 155 160

Glu Val Asp Leu Ile Pro Ser Cys Leu Gly Leu Lys Lys Asn Asn Val
165 170 175

Cys Glu Asn Ser Ile Thr Cys Asn Lys Asp Asp Glu Lys Asp Asp Phe
180 185 190

Val Asn Asn Leu Met Asn Gly Asp Asn Met Trp Leu Glu Asn Leu Leu
195 200 205

Gly Glu Asn Gln Glu Ala Asp Ala Ile Val Pro Glu Ala Thr Thr Ala
210 215 220

Glu His Gly Ala Thr Leu Ala Phe Asp Val Glu Gln Leu Trp Ser Leu
225 230 235 240

Phe Asp Gly Glu Thr Val Glu Leu Asp
245

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taa atg gaa tcg agt agc gtt gat gag agt act aca agt aca ggt tcc 108
Met Glu Ser Ser Ser Val Asp Glu Ser Thr Thr Ser Thr Gly Ser
1 5 10 15

atc tgt gaa acc ccg gcg ata act ccg gcg aaa aag tcg tcg gta ggt 156
Ile Cys Glu Thr Pro Ala Ile Thr Pro Ala Lys Lys Ser Ser Val Gly
20 25 30

aac tta tac agg atg gga agc gga tca agc gtt gtg tta gat tca gag 204
Asn Leu Tyr Arg Met Gly Ser Gly Ser Ser Val Val Leu Asp Ser Glu
35 40 45

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aac ggc gta gaa gct gaa tct agg aag ctt ccg tcg tca aaa tac aaa      252
Asn Gly Val Glu Ala Glu Ser Arg Lys Leu Pro Ser Ser Lys Tyr Lys
        50                  55                  60

ggt gtg gtg cca caa cca aac gga aga tgg gga gct cag att tac gag      300
Gly Val Val Pro Gln Pro Asn Gly Arg Trp Gly Ala Gln Ile Tyr Glu
    65                  70                  75

aaa cac cag cgc gtg tgg ctc ggg aca ttc aac gaa gaa gac gaa gcc      348
Lys His Gln Arg Val Trp Leu Gly Thr Phe Asn Glu Glu Asp Glu Ala
80                  85                  90                  95

gct cgt gcc tac gac gtc gcg gtt cac agg ttc cgt cgc cgt gac gcc      396
Ala Arg Ala Tyr Asp Val Ala Val His Arg Phe Arg Arg Arg Asp Ala
                100                 105                 110

gtc aca aat ttc aaa gac gtg aag atg gac gaa gac gag gtc gat ttc      444
Val Thr Asn Phe Lys Asp Val Lys Met Asp Glu Asp Glu Val Asp Phe
            115                 120                 125

ttg aat tct cat tcg aaa tct gag atc gtt gat atg ttg agg aaa cat      492
Leu Asn Ser His Ser Lys Ser Glu Ile Val Asp Met Leu Arg Lys His
        130                 135                 140

act tat aac gaa gag tta gag cag agt aaa cgg cgt cgt aat ggt aac      540
Thr Tyr Asn Glu Glu Leu Glu Gln Ser Lys Arg Arg Arg Asn Gly Asn
    145                 150                 155

gga aac atg act agg acg ttg tta acg tcg ggg ttg agt aat gat ggt      588
Gly Asn Met Thr Arg Thr Leu Leu Thr Ser Gly Leu Ser Asn Asp Gly
160                 165                 170                 175

gtt tct acg acg ggg ttt aga tcg gcg gag gca ctg ttt gag aaa gcg      636
Val Ser Thr Thr Gly Phe Arg Ser Ala Glu Ala Leu Phe Glu Lys Ala
                180                 185                 190

gta acg cca agc gac gtt ggg aag cta aac cgt ttg gtt ata ccg aaa      684
Val Thr Pro Ser Asp Val Gly Lys Leu Asn Arg Leu Val Ile Pro Lys
            195                 200                 205

cat cac gca gag aaa cat ttt ccg tta ccg tca agt aac gtt tcc gtg      732
His His Ala Glu Lys His Phe Pro Leu Pro Ser Ser Asn Val Ser Val
        210                 215                 220

aaa gga gtg ttg ttg aac ttt gag gac gtt aac ggg aaa gtg tgg agg      780
Lys Gly Val Leu Leu Asn Phe Glu Asp Val Asn Gly Lys Val Trp Arg
    225                 230                 235

ttc cgt tac tcg tat tgg aac agt agt cag agt tat gtt ttg act aaa      828
Phe Arg Tyr Ser Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys
240                 245                 250                 255

ggt tgg agc agg ttc gtt aag gag aag aat cta cgt gct ggt gac gtg      876
Gly Trp Ser Arg Phe Val Lys Glu Lys Asn Leu Arg Ala Gly Asp Val
                260                 265                 270
```

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gtt agt ttc agt aga tct aac ggt cag gat caa cag ttg tac att ggg      924
Val Ser Phe Ser Arg Ser Asn Gly Gln Asp Gln Gln Leu Tyr Ile Gly
            275                 280                 285

tgg aag tcg aga tcc ggg tca gat tta gat gcg ggt cgg gtt ttg aga      972
Trp Lys Ser Arg Ser Gly Ser Asp Leu Asp Ala Gly Arg Val Leu Arg
        290                 295                 300

ttg ttc gga gtt aac att tca ccg gag agt tca aga aac gac gtc gta     1020
Leu Phe Gly Val Asn Ile Ser Pro Glu Ser Ser Arg Asn Asp Val Val
    305                 310                 315

gga aac aaa aga gtg aac gat act gag atg tta tcg ttg gtg tgt agc     1068
Gly Asn Lys Arg Val Asn Asp Thr Glu Met Leu Ser Leu Val Cys Ser
320                 325                 330                 335

aag aag caa cgc atc ttt cac gcc tcg taa caactcttct tctttttttt       1118
Lys Lys Gln Arg Ile Phe His Ala Ser
                340

tcttttgttg ttttaataat ttttaaaaac tccattttcg ttttctttat ttgcatcggt   1178

ttctttcttc ttgtttacca aaggttcatg agttgttttt gttgtattga tgaactgtaa   1238

attttattta taggataaat tttaaaaaaa aaaaaaaaaa aaa                     1281
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Met Glu Ser Ser Ser Val Asp Glu Ser Thr Thr Ser Thr Gly Ser Ile
1               5                   10                  15

Cys Glu Thr Pro Ala Ile Thr Pro Ala Lys Lys Ser Ser Val Gly Asn
            20                  25                  30

Leu Tyr Arg Met Gly Ser Gly Ser Ser Val Val Leu Asp Ser Glu Asn
        35                  40                  45

Gly Val Glu Ala Glu Ser Arg Lys Leu Pro Ser Ser Lys Tyr Lys Gly
    50                  55                  60

Val Val Pro Gln Pro Asn Gly Arg Trp Gly Ala Gln Ile Tyr Glu Lys
65                  70                  75                  80

His Gln Arg Val Trp Leu Gly Thr Phe Asn Glu Glu Asp Glu Ala Ala
                85                  90                  95

Arg Ala Tyr Asp Val Ala Val His Arg Phe Arg Arg Arg Asp Ala Val
            100                 105                 110
```

Thr Asn Phe Lys Asp Val Lys Met Asp Glu Asp Glu Val Asp Phe Leu
115 120 125

Asn Ser His Ser Lys Ser Glu Ile Val Asp Met Leu Arg Lys His Thr
130 135 140

Tyr Asn Glu Glu Leu Glu Gln Ser Lys Arg Arg Arg Asn Gly Asn Gly
145 150 155 160

Asn Met Thr Arg Thr Leu Leu Thr Ser Gly Leu Ser Asn Asp Gly Val
165 170 175

Ser Thr Thr Gly Phe Arg Ser Ala Glu Ala Leu Phe Glu Lys Ala Val
180 185 190

Thr Pro Ser Asp Val Gly Lys Leu Asn Arg Leu Val Ile Pro Lys His
195 200 205

His Ala Glu Lys His Phe Pro Leu Pro Ser Ser Asn Val Ser Val Lys
210 215 220

Gly Val Leu Leu Asn Phe Glu Asp Val Asn Gly Lys Val Trp Arg Phe
225 230 235 240

Arg Tyr Ser Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys Gly
245 250 255

Trp Ser Arg Phe Val Lys Glu Lys Asn Leu Arg Ala Gly Asp Val Val
260 265 270

Ser Phe Ser Arg Ser Asn Gly Gln Asp Gln Gln Leu Tyr Ile Gly Trp
275 280 285

Lys Ser Arg Ser Gly Ser Asp Leu Asp Ala Gly Arg Val Leu Arg Leu
290 295 300

Phe Gly Val Asn Ile Ser Pro Glu Ser Ser Arg Asn Asp Val Val Gly
305 310 315 320

Asn Lys Arg Val Asn Asp Thr Glu Met Leu Ser Leu Val Cys Ser Lys
325 330 335

Lys Gln Arg Ile Phe His Ala Ser

340

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<222> (397)..(2460) <223> G877

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agttgtaaag ttttgatttt ttttctgggg ttttttctgt gagacccaga agaagaacag 120

agagaggaag aaggagaaga aaaaaatatc tctttctctc cggctttcaa caaaatctct 180

ctttttttcct tcatcagtgt taaattcgga tccgggtcgg gtgggttttc ggtttttggt 240

gttcggatca gagcacagtt ggatgttagc gacggaactg aggatttcag tttgcggctg 300

cggcggctgt gacggtgttt gtgtgtcgtc ttcttttatc aatcaggagt ttcatcacag 360

tttgatcaga gattcagcca attcttgga tactaa atg gct ggt ttt gat gaa 414
Met Ala Gly Phe Asp Glu
1 5

aat gtt gct gtg atg gga gaa tgg gtg cct cgt agt cct agt ccc ggg 462
Asn Val Ala Val Met Gly Glu Trp Val Pro Arg Ser Pro Ser Pro Gly
10 15 20

aca ctt ttc tcc tct gct att gga gaa gag aag agc tcg aaa cgt gtt 510
Thr Leu Phe Ser Ser Ala Ile Gly Glu Glu Lys Ser Ser Lys Arg Val
25 30 35

ctt gaa aga gag tta tct ttg aat cat ggt caa gtt att ggt tta gaa 558
Leu Glu Arg Glu Leu Ser Leu Asn His Gly Gln Val Ile Gly Leu Glu
40 45 50

gaa gac act agt agt aat cat aac aag gat tct tca caa agc aat gtt 606
Glu Asp Thr Ser Ser Asn His Asn Lys Asp Ser Ser Gln Ser Asn Val
55 60 65 70

ttt cga ggt ggt ctc agt gaa aga att gct gca aga gct gga ttt aat 654
Phe Arg Gly Gly Leu Ser Glu Arg Ile Ala Ala Arg Ala Gly Phe Asn
75 80 85

gct cca agg ttg aac act gag aat atc cgc acc aac acc gac ttt tcc 702
Ala Pro Arg Leu Asn Thr Glu Asn Ile Arg Thr Asn Thr Asp Phe Ser
90 95 100

att gac tct aac ctt cga tct cct tgc tta acc atc tct tct cct ggc 750
Ile Asp Ser Asn Leu Arg Ser Pro Cys Leu Thr Ile Ser Ser Pro Gly
105 110 115

ctt agc cct gca aca ctc ttg gaa tct cct gtt ttc ctt tct aac cca 798
Leu Ser Pro Ala Thr Leu Leu Glu Ser Pro Val Phe Leu Ser Asn Pro
120 125 130

ttg gct caa cct tct cca act acc ggg aaa ttt cca ttt ctt cct ggt 846
Leu Ala Gln Pro Ser Pro Thr Thr Gly Lys Phe Pro Phe Leu Pro Gly

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135                 140                 145                 150

gtt aat ggt aat gca ttg tct tct gag aaa gcg aaa gac gag ttc ttt      894
Val Asn Gly Asn Ala Leu Ser Ser Glu Lys Ala Lys Asp Glu Phe Phe
                155                 160                 165

gat gat att gga gca tca ttc agc ttc cat cct gtt tca aga tca tct      942
Asp Asp Ile Gly Ala Ser Phe Ser Phe His Pro Val Ser Arg Ser Ser
            170                 175                 180

tcc tct ttc ttc caa ggc aca aca gag atg atg tca gtt gat tat ggt      990
Ser Ser Phe Phe Gln Gly Thr Thr Glu Met Met Ser Val Asp Tyr Gly
        185                 190                 195

aac tac aac aat aga tct tct tct cat caa tcc gca gaa gaa gta aaa     1038
Asn Tyr Asn Asn Arg Ser Ser Ser His Gln Ser Ala Glu Glu Val Lys
    200                 205                 210

cct ggc tct gaa aac ata gaa agc tcc aat ctt tat ggg att gaa act     1086
Pro Gly Ser Glu Asn Ile Glu Ser Ser Asn Leu Tyr Gly Ile Glu Thr
215                 220                 225                 230

gac aat caa aac ggg cag aac aag aca tct gat gtc act aca aac acc     1134
Asp Asn Gln Asn Gly Gln Asn Lys Thr Ser Asp Val Thr Thr Asn Thr
                235                 240                 245

agt ctt gaa acc gtg gat cat caa gag gaa gaa gaa gag caa aga cgc     1182
Ser Leu Glu Thr Val Asp His Gln Glu Glu Glu Glu Glu Gln Arg Arg
            250                 255                 260

ggt gat tcg atg gct ggt ggt gcg cct gca gag gat gga tat aac tgg     1230
Gly Asp Ser Met Ala Gly Gly Ala Pro Ala Glu Asp Gly Tyr Asn Trp
        265                 270                 275

agg aaa tac gga caa aag ttg gtc aaa gga agt gag tat ccg cga agc     1278
Arg Lys Tyr Gly Gln Lys Leu Val Lys Gly Ser Glu Tyr Pro Arg Ser
    280                 285                 290

tat tac aag tgc aca aac ccg aat tgt cag gtg aag aag aaa gtt gag     1326
Tyr Tyr Lys Cys Thr Asn Pro Asn Cys Gln Val Lys Lys Lys Val Glu
295                 300                 305                 310

aga tca agg gaa ggt cac atc aca gag att ata tac aaa gga gct cat     1374
Arg Ser Arg Glu Gly His Ile Thr Glu Ile Ile Tyr Lys Gly Ala His
                315                 320                 325

aat cat ctt aaa cct cca cct aat cgc cgc tca ggg atg caa gta gat     1422
Asn His Leu Lys Pro Pro Pro Asn Arg Arg Ser Gly Met Gln Val Asp
            330                 335                 340

gga act gaa caa gtt gaa caa caa caa caa cag aga gat tct gct gca     1470
Gly Thr Glu Gln Val Glu Gln Gln Gln Gln Gln Arg Asp Ser Ala Ala
        345                 350                 355

acg tgg gtt agt tgt aat aac act caa caa caa ggt gga agc aat gag     1518
Thr Trp Val Ser Cys Asn Asn Thr Gln Gln Gln Gly Gly Ser Asn Glu
    360                 365                 370
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aac aat gtc gaa gag gga tct acg aga ttc gag tat gga aac caa tct     1566
Asn Asn Val Glu Glu Gly Ser Thr Arg Phe Glu Tyr Gly Asn Gln Ser
375                 380                 385                 390

gga tca att caa gct caa acc gga ggt caa tac gag tca ggt gat cct     1614
Gly Ser Ile Gln Ala Gln Thr Gly Gly Gln Tyr Glu Ser Gly Asp Pro
                395                 400                 405

gtg gtt gtg gtt gat gct tct tca aca ttc tct aat gat gaa gat gaa     1662
Val Val Val Val Asp Ala Ser Ser Thr Phe Ser Asn Asp Glu Asp Glu
            410                 415                 420

gat gat cga ggg aca cat gga agt gtt tct ttg ggt tac gat gga gga     1710
Asp Asp Arg Gly Thr His Gly Ser Val Ser Leu Gly Tyr Asp Gly Gly
        425                 430                 435

gga gga ggt ggg gga gga gaa gga gat gaa tca gag tcg aaa aga agg     1758
Gly Gly Gly Gly Gly Gly Glu Gly Asp Glu Ser Glu Ser Lys Arg Arg
    440                 445                 450

aaa cta gaa gct ttt gca gca gag atg agt gga tca aca aga gcc ata     1806
Lys Leu Glu Ala Phe Ala Ala Glu Met Ser Gly Ser Thr Arg Ala Ile
455                 460                 465                 470

cgt gag cca aga gtt gtt gtg cag aca acg agt gat gtt gac att ctt     1854
Arg Glu Pro Arg Val Val Val Gln Thr Thr Ser Asp Val Asp Ile Leu
                475                 480                 485

gat gat ggt tat cgc tgg cga aaa tat ggt cag aaa gtt gtc aaa ggc     1902
Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Val Val Lys Gly
            490                 495                 500

aat cca aat cca agg agt tat tac aaa tgc aca gct cca gga tgt aca     1950
Asn Pro Asn Pro Arg Ser Tyr Tyr Lys Cys Thr Ala Pro Gly Cys Thr
        505                 510                 515

gtg agg aaa cat gtt gaa aga gct tct cat gat ctc aaa tcc gtt ata     1998
Val Arg Lys His Val Glu Arg Ala Ser His Asp Leu Lys Ser Val Ile
    520                 525                 530

aca act tac gaa ggc aaa cat aac cat gac gtc ccc gct gca cgc aac     2046
Thr Thr Tyr Glu Gly Lys His Asn His Asp Val Pro Ala Ala Arg Asn
535                 540                 545                 550

agc agc cac gga ggc ggt ggt gat agt ggt aac ggt aac agc ggc ggt     2094
Ser Ser His Gly Gly Gly Gly Asp Ser Gly Asn Gly Asn Ser Gly Gly
                555                 560                 565

tca gcc gca gtt tct cac cat tac cac aac ggt cat cac tca gag ccg     2142
Ser Ala Ala Val Ser His His Tyr His Asn Gly His His Ser Glu Pro
            570                 575                 580

cca cgt ggg aga ttc gac aga caa gtc aca act aac aat cag tct cct     2190
Pro Arg Gly Arg Phe Asp Arg Gln Val Thr Thr Asn Asn Gln Ser Pro
        585                 590                 595
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ttt agc cgt ccc ttt agc ttt cag cca cat ttg ggt cct cct tct ggt     2238
Phe Ser Arg Pro Phe Ser Phe Gln Pro His Leu Gly Pro Pro Ser Gly
    600                 605                 610

ttc tcc ttc ggt tta gga caa acc ggt ttg gtt aat ctt tca atg cct     2286
Phe Ser Phe Gly Leu Gly Gln Thr Gly Leu Val Asn Leu Ser Met Pro
615                 620                 625                 630

ggt tta gcg tat ggt caa ggg aaa atg ccg ggt ttg cct cac ccg tat     2334
Gly Leu Ala Tyr Gly Gln Gly Lys Met Pro Gly Leu Pro His Pro Tyr
                635                 640                 645

atg aca caa ccg gtt ggg atg agt gaa gca atg atg cag aga ggg atg     2382
Met Thr Gln Pro Val Gly Met Ser Glu Ala Met Met Gln Arg Gly Met
            650                 655                 660

gaa cca aag gtt gaa ccg gtt tca gat tca gga caa tcg gta tat aac     2430
Glu Pro Lys Val Glu Pro Val Ser Asp Ser Gly Gln Ser Val Tyr Asn
        665                 670                 675

cag atc atg agt aga tta cct cag att tga aatttactct tcttcttctt       2480
Gln Ile Met Ser Arg Leu Pro Gln Ile
    680                 685

cttctgcatt tggtcactcc ttataataac ttttaatttc tgcttcttct tcttctttca   2540

tttattggtt tcaaactttg gggaaggtaa aggctgtttt attgttaaaa aaaaaaaaaa   2600

aaa                                                                 2603
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Met Ala Gly Phe Asp Glu Asn Val Ala Val Met Gly Glu Trp Val Pro
1               5                   10                  15

Arg Ser Pro Ser Pro Gly Thr Leu Phe Ser Ser Ala Ile Gly Glu Glu
            20                  25                  30

Lys Ser Ser Lys Arg Val Leu Glu Arg Glu Leu Ser Leu Asn His Gly
        35                  40                  45

Gln Val Ile Gly Leu Glu Glu Asp Thr Ser Ser Asn His Asn Lys Asp
    50                  55                  60

Ser Ser Gln Ser Asn Val Phe Arg Gly Gly Leu Ser Glu Arg Ile Ala
65                  70                  75                  80

Ala Arg Ala Gly Phe Asn Ala Pro Arg Leu Asn Thr Glu Asn Ile Arg
                85                  90                  95
```

Thr Asn Thr Asp Phe Ser Ile Asp Ser Asn Leu Arg Ser Pro Cys Leu
100 105 110

Thr Ile Ser Ser Pro Gly Leu Ser Pro Ala Thr Leu Leu Glu Ser Pro
115 120 125

Val Phe Leu Ser Asn Pro Leu Ala Gln Pro Ser Pro Thr Thr Gly Lys
130 135 140

Phe Pro Phe Leu Pro Gly Val Asn Gly Asn Ala Leu Ser Ser Glu Lys
145 150 155 160

Ala Lys Asp Glu Phe Phe Asp Asp Ile Gly Ala Ser Phe Ser Phe His
165 170 175

Pro Val Ser Arg Ser Ser Ser Ser Phe Phe Gln Gly Thr Thr Glu Met
180 185 190

Met Ser Val Asp Tyr Gly Asn Tyr Asn Asn Arg Ser Ser Ser His Gln
195 200 205

Ser Ala Glu Glu Val Lys Pro Gly Ser Glu Asn Ile Glu Ser Ser Asn
210 215 220

Leu Tyr Gly Ile Glu Thr Asp Asn Gln Asn Gly Gln Asn Lys Thr Ser
225 230 235 240

Asp Val Thr Thr Asn Thr Ser Leu Glu Thr Val Asp His Gln Glu Glu
245 250 255

Glu Glu Glu Gln Arg Arg Gly Asp Ser Met Ala Gly Gly Ala Pro Ala
260 265 270

Glu Asp Gly Tyr Asn Trp Arg Lys Tyr Gly Gln Lys Leu Val Lys Gly
275 280 285

Ser Glu Tyr Pro Arg Ser Tyr Tyr Lys Cys Thr Asn Pro Asn Cys Gln
290 295 300

Val Lys Lys Lys Val Glu Arg Ser Arg Glu Gly His Ile Thr Glu Ile
305 310 315 320

Ile Tyr Lys Gly Ala His Asn His Leu Lys Pro Pro Pro Asn Arg Arg

325 330 335

Ser Gly Met Gln Val Asp Gly Thr Glu Gln Val Glu Gln Gln Gln Gln
340 345 350

Gln Arg Asp Ser Ala Ala Thr Trp Val Ser Cys Asn Asn Thr Gln Gln
355 360 365

Gln Gly Gly Ser Asn Glu Asn Asn Val Glu Glu Gly Ser Thr Arg Phe
370 375 380

Glu Tyr Gly Asn Gln Ser Gly Ser Ile Gln Ala Gln Thr Gly Gly Gln
385 390 395 400

Tyr Glu Ser Gly Asp Pro Val Val Val Val Asp Ala Ser Ser Thr Phe
405 410 415

Ser Asn Asp Glu Asp Glu Asp Asp Arg Gly Thr His Gly Ser Val Ser
420 425 430

Leu Gly Tyr Asp Gly Gly Gly Gly Gly Gly Gly Gly Glu Gly Asp Glu
435 440 445

Ser Glu Ser Lys Arg Arg Lys Leu Glu Ala Phe Ala Ala Glu Met Ser
450 455 460

Gly Ser Thr Arg Ala Ile Arg Glu Pro Arg Val Val Val Gln Thr Thr
465 470 475 480

Ser Asp Val Asp Ile Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly
485 490 495

Gln Lys Val Val Lys Gly Asn Pro Asn Pro Arg Ser Tyr Tyr Lys Cys
500 505 510

Thr Ala Pro Gly Cys Thr Val Arg Lys His Val Glu Arg Ala Ser His
515 520 525

Asp Leu Lys Ser Val Ile Thr Thr Tyr Glu Gly Lys His Asn His Asp
530 535 540

Val Pro Ala Ala Arg Asn Ser Ser His Gly Gly Gly Gly Asp Ser Gly
545 550 555 560

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Asn Gly Asn Ser Gly Gly Ser Ala Ala Val Ser His His Tyr His Asn
                565                 570                 575

Gly His His Ser Glu Pro Pro Arg Gly Arg Phe Asp Arg Gln Val Thr
            580                 585                 590

Thr Asn Asn Gln Ser Pro Phe Ser Arg Pro Phe Ser Phe Gln Pro His
        595                 600                 605

Leu Gly Pro Pro Ser Gly Phe Ser Phe Gly Leu Gly Gln Thr Gly Leu
    610                 615                 620

Val Asn Leu Ser Met Pro Gly Leu Ala Tyr Gly Gln Gly Lys Met Pro
625                 630                 635                 640

Gly Leu Pro His Pro Tyr Met Thr Gln Pro Val Gly Met Ser Glu Ala
                645                 650                 655

Met Met Gln Arg Gly Met Glu Pro Lys Val Glu Pro Val Ser Asp Ser
            660                 665                 670

Gly Gln Ser Val Tyr Asn Gln Ile Met Ser Arg Leu Pro Gln Ile
        675                 680                 685
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catcttatcc aaagaaaaa atg aat cca ttt tac tct aca ttc cca gac tcg      52
                       Met Asn Pro Phe Tyr Ser Thr Phe Pro Asp Ser
                       1               5                   10

ttt ctc tca atc tcc gat cat aga tct ccg gtt tca gac agt agt gag      100
Phe Leu Ser Ile Ser Asp His Arg Ser Pro Val Ser Asp Ser Ser Glu
            15                  20                  25

tgt tca cca aag tta gct tca agt tgt cca aag aaa cga gct ggg agg      148
Cys Ser Pro Lys Leu Ala Ser Ser Cys Pro Lys Lys Arg Ala Gly Arg
        30                  35                  40

aag aag ttt cgt gag aca cgt cat ccg att tac aga gga gtt cgt cag      196
Lys Lys Phe Arg Glu Thr Arg His Pro Ile Tyr Arg Gly Val Arg Gln
    45                  50                  55

agg aat tct ggt aaa tgg gtt tgt gaa gtt aga gag cct aat aag aaa      244
Arg Asn Ser Gly Lys Trp Val Cys Glu Val Arg Glu Pro Asn Lys Lys
60                  65                  70                  75
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tct agg att tgg tta ggt act ttt ccg acg gtt gaa atg gct gct cgt      292
Ser Arg Ile Trp Leu Gly Thr Phe Pro Thr Val Glu Met Ala Ala Arg
                80                  85                  90

gct cat gat gtt gct gct tta gct ctt cgt ggt cgc tct gct tgt ctc      340
Ala His Asp Val Ala Ala Leu Ala Leu Arg Gly Arg Ser Ala Cys Leu
            95                  100                 105

aat ttc gct gat tct gct tgg cgg ctt cgt att cct gag act act tgt      388
Asn Phe Ala Asp Ser Ala Trp Arg Leu Arg Ile Pro Glu Thr Thr Cys
        110                 115                 120

cct aag gag att cag aaa gct gcg tct gaa gct gca atg gcg ttt cag      436
Pro Lys Glu Ile Gln Lys Ala Ala Ser Glu Ala Ala Met Ala Phe Gln
    125                 130                 135

aat gag act acg acg gag gga tct aaa act gcg gcg gag gca gag gag      484
Asn Glu Thr Thr Thr Glu Gly Ser Lys Thr Ala Ala Glu Ala Glu Glu
140                 145                 150                 155

gcg gca ggg gag ggg gtg agg gag ggg gag agg agg gcg gag gag cag      532
Ala Ala Gly Glu Gly Val Arg Glu Gly Glu Arg Arg Ala Glu Glu Gln
                160                 165                 170

aat ggt ggt gtg ttt tat atg gat gat gag gcg ctt ttg ggg atg ccc      580
Asn Gly Gly Val Phe Tyr Met Asp Asp Glu Ala Leu Leu Gly Met Pro
            175                 180                 185

aac ttt ttt gag aat atg gcg gag ggg atg ctt ttg ccg ccg ccg gaa      628
Asn Phe Phe Glu Asn Met Ala Glu Gly Met Leu Leu Pro Pro Pro Glu
        190                 195                 200

gtt ggc tgg aat cat aac gac ttt gac gga gtg ggt gac gtg tca ctc      676
Val Gly Trp Asn His Asn Asp Phe Asp Gly Val Gly Asp Val Ser Leu
    205                 210                 215

tgg agt ttt gac gag taa ttttttggct ctttttctgg ataataagtt             724
Trp Ser Phe Asp Glu
220
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Met Asn Pro Phe Tyr Ser Thr Phe Pro Asp Ser Phe Leu Ser Ile Ser
1               5                   10                  15

Asp His Arg Ser Pro Val Ser Asp Ser Ser Glu Cys Ser Pro Lys Leu
            20                  25                  30

Ala Ser Ser Cys Pro Lys Lys Arg Ala Gly Arg Lys Lys Phe Arg Glu
        35                  40                  45

Thr Arg His Pro Ile Tyr Arg Gly Val Arg Gln Arg Asn Ser Gly Lys
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    50                  55                  60

Trp Val Cys Glu Val Arg Glu Pro Asn Lys Lys Ser Arg Ile Trp Leu
65                  70                  75                  80

Gly Thr Phe Pro Thr Val Glu Met Ala Ala Arg Ala His Asp Val Ala
                85                  90                  95

Ala Leu Ala Leu Arg Gly Arg Ser Ala Cys Leu Asn Phe Ala Asp Ser
            100                 105                 110

Ala Trp Arg Leu Arg Ile Pro Glu Thr Thr Cys Pro Lys Glu Ile Gln
        115                 120                 125

Lys Ala Ala Ser Glu Ala Ala Met Ala Phe Gln Asn Glu Thr Thr Thr
    130                 135                 140

Glu Gly Ser Lys Thr Ala Ala Glu Ala Glu Glu Ala Ala Gly Glu Gly
145                 150                 155                 160

Val Arg Glu Gly Glu Arg Arg Ala Glu Glu Gln Asn Gly Gly Val Phe
                165                 170                 175

Tyr Met Asp Asp Glu Ala Leu Leu Gly Met Pro Asn Phe Phe Glu Asn
            180                 185                 190

Met Ala Glu Gly Met Leu Leu Pro Pro Pro Glu Val Gly Trp Asn His
        195                 200                 205

Asn Asp Phe Asp Gly Val Gly Asp Val Ser Leu Trp Ser Phe Asp Glu
    210                 215                 220
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<222> (1)..(4011) <223> G987

<400> 21

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atg ggt tct tac tca gct ggc ttc cct gga tcc ttg gac tgg ttt gat       48
Met Gly Ser Tyr Ser Ala Gly Phe Pro Gly Ser Leu Asp Trp Phe Asp
1               5                   10                  15

ttt ccc ggt tta gga aac gga tcc tat cta aat gat caa cct ttg tta       96
Phe Pro Gly Leu Gly Asn Gly Ser Tyr Leu Asn Asp Gln Pro Leu Leu
            20                  25                  30

gat att gga tct gtt cct cct cct cta gac cca tat cct caa cag aat      144
Asp Ile Gly Ser Val Pro Pro Pro Leu Asp Pro Tyr Pro Gln Gln Asn
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        35                  40                  45

ctt gct tct gcg gat gct gat ttc tct gat tct gtt ttg aag tac ata      192
Leu Ala Ser Ala Asp Ala Asp Phe Ser Asp Ser Val Leu Lys Tyr Ile
    50                  55                  60

agc caa gtt ctt atg gaa gag gac atg gaa gat aag cct tgt atg ttt      240
Ser Gln Val Leu Met Glu Glu Asp Met Glu Asp Lys Pro Cys Met Phe
65                  70                  75                  80

cat gat gct tta tct ctt caa gca gct gag aag tct ctc tat gaa gct      288
His Asp Ala Leu Ser Leu Gln Ala Ala Glu Lys Ser Leu Tyr Glu Ala
                85                  90                  95

ctc ggc gag aag tac ccg gtt gat gat tct gat cag cct ctg act act      336
Leu Gly Glu Lys Tyr Pro Val Asp Asp Ser Asp Gln Pro Leu Thr Thr
            100                 105                 110

act act agc ctt gct caa ttg gtt agt agt cct ggt ggt tct tct tat      384
Thr Thr Ser Leu Ala Gln Leu Val Ser Ser Pro Gly Gly Ser Ser Tyr
        115                 120                 125

gct tca agc acc aca acc act tcc tct gat tca caa tgg agt ttt gat      432
Ala Ser Ser Thr Thr Thr Thr Ser Ser Asp Ser Gln Trp Ser Phe Asp
    130                 135                 140

tgt ttg gag aat aat agg cct tct tct tgg ttg cag aca ccg atc ccg      480
Cys Leu Glu Asn Asn Arg Pro Ser Ser Trp Leu Gln Thr Pro Ile Pro
145                 150                 155                 160

agt aac ttc att ttt cag tct aca tct act aga gcc agt agc ggt aac      528
Ser Asn Phe Ile Phe Gln Ser Thr Ser Thr Arg Ala Ser Ser Gly Asn
                165                 170                 175

gcg gtt ttc ggg tca agt ttt agc ggt gat ttg gtt tct aat atg ttt      576
Ala Val Phe Gly Ser Ser Phe Ser Gly Asp Leu Val Ser Asn Met Phe
            180                 185                 190

aat gat act gac ttg gcg tta caa ttc aag aaa ggg atg gag gaa gct      624
Asn Asp Thr Asp Leu Ala Leu Gln Phe Lys Lys Gly Met Glu Glu Ala
        195                 200                 205

agt aaa ttc ctt cct aag agc tct cag ttg gtt ata gat aac tct gtt      672
Ser Lys Phe Leu Pro Lys Ser Ser Gln Leu Val Ile Asp Asn Ser Val
    210                 215                 220

cct aac aga tta acc gga aag aag agc cat tgg cgc gaa gaa gaa cat      720
Pro Asn Arg Leu Thr Gly Lys Lys Ser His Trp Arg Glu Glu Glu His
225                 230                 235                 240

ttg act gaa gaa aga agt aag aaa caa tct gct att tat gtt gat gaa      768
Leu Thr Glu Glu Arg Ser Lys Lys Gln Ser Ala Ile Tyr Val Asp Glu
                245                 250                 255

act gat gag ctt act gat atg ttt gac aat att ctg ata ttt ggc gag      816
Thr Asp Glu Leu Thr Asp Met Phe Asp Asn Ile Leu Ile Phe Gly Glu
            260                 265                 270
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gct aag gaa caa cct gta tgc att ctt aac gag agt ttc cct aag gaa      864
Ala Lys Glu Gln Pro Val Cys Ile Leu Asn Glu Ser Phe Pro Lys Glu
        275                 280                 285

cct gcg aaa gct tca acg ttt agt aag agt cct aaa ggc gaa aaa ccg      912
Pro Ala Lys Ala Ser Thr Phe Ser Lys Ser Pro Lys Gly Glu Lys Pro
    290                 295                 300

gaa gct agt ggt aac agt tat aca aaa gag aca cct gat ttg agg aca      960
Glu Ala Ser Gly Asn Ser Tyr Thr Lys Glu Thr Pro Asp Leu Arg Thr
305                 310                 315                 320

atg ctg gtt tct tgt gct caa gct gtt tcg att aac gat cgt aga act     1008
Met Leu Val Ser Cys Ala Gln Ala Val Ser Ile Asn Asp Arg Arg Thr
                325                 330                 335

gct gac gag ctg tta agt cgg ata agg caa cat tct tca tct tac ggc     1056
Ala Asp Glu Leu Leu Ser Arg Ile Arg Gln His Ser Ser Ser Tyr Gly
            340                 345                 350

gat gga aca gag aga ttg gct cat tat ttt gct aac agt ctt gaa gca     1104
Asp Gly Thr Glu Arg Leu Ala His Tyr Phe Ala Asn Ser Leu Glu Ala
        355                 360                 365

cgt ttg gct ggg ata ggt aca cag gtt tat act gcc ttg tct tcc aag     1152
Arg Leu Ala Gly Ile Gly Thr Gln Val Tyr Thr Ala Leu Ser Ser Lys
    370                 375                 380

aaa aca tct act tct gac atg ttg aaa gct tat cag aca tat ata tca     1200
Lys Thr Ser Thr Ser Asp Met Leu Lys Ala Tyr Gln Thr Tyr Ile Ser
385                 390                 395                 400

gtc tgt ccg ttc aag aaa atc gca atc ata ttc gcc aac cat agt att     1248
Val Cys Pro Phe Lys Lys Ile Ala Ile Ile Phe Ala Asn His Ser Ile
                405                 410                 415

atg cgg ttg gct tca agt gct aat gcc aaa acc atc cac atc ata gat     1296
Met Arg Leu Ala Ser Ser Ala Asn Ala Lys Thr Ile His Ile Ile Asp
            420                 425                 430

ttt gga ata tct gat ggt ttc cag tgg cct tct ctg att cat cga ctt     1344
Phe Gly Ile Ser Asp Gly Phe Gln Trp Pro Ser Leu Ile His Arg Leu
        435                 440                 445

gct tgg aga cgt ggt tca tct tgt aag ctt cgg ata acc ggt ata gag     1392
Ala Trp Arg Arg Gly Ser Ser Cys Lys Leu Arg Ile Thr Gly Ile Glu
    450                 455                 460

ttg cct caa cgt ggt ttt aga cca gcc gag gga gtt att gag act ggt     1440
Leu Pro Gln Arg Gly Phe Arg Pro Ala Glu Gly Val Ile Glu Thr Gly
465                 470                 475                 480

cgt cgc ttg gct aag tat tgt cag aag ttc aat att ccg ttt gag tac     1488
Arg Arg Leu Ala Lys Tyr Cys Gln Lys Phe Asn Ile Pro Phe Glu Tyr
                485                 490                 495
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aat gcg att gcg cag aaa tgg gaa tca atc aag ttg gag gac ttg aag     1536
Asn Ala Ile Ala Gln Lys Trp Glu Ser Ile Lys Leu Glu Asp Leu Lys
            500                 505                 510

cta aaa gaa ggc gag ttt gtt gcg gta aac tct tta ttt cgg ttt agg     1584
Leu Lys Glu Gly Glu Phe Val Ala Val Asn Ser Leu Phe Arg Phe Arg
        515                 520                 525

aat ctt cta gat gag acg gtg gca gtg cat agc ccg aga gat acg gtt     1632
Asn Leu Leu Asp Glu Thr Val Ala Val His Ser Pro Arg Asp Thr Val
    530                 535                 540

ttg aag ctg ata agg aag ata aag cca gac gtg ttc atc ccc ggg atc     1680
Leu Lys Leu Ile Arg Lys Ile Lys Pro Asp Val Phe Ile Pro Gly Ile
545                 550                 555                 560

ctc agc gga tcc tac aac gcg cct ttc ttt gtc acg agg ttt aga gaa     1728
Leu Ser Gly Ser Tyr Asn Ala Pro Phe Phe Val Thr Arg Phe Arg Glu
                565                 570                 575

gtt ctg ttt cat tac tca tct ctg ttt gac atg tgt gac acg aat cta     1776
Val Leu Phe His Tyr Ser Ser Leu Phe Asp Met Cys Asp Thr Asn Leu
            580                 585                 590

aca cgg gaa gat cca atg agg gtt atg ttt gag aaa gag ttc tat ggg     1824
Thr Arg Glu Asp Pro Met Arg Val Met Phe Glu Lys Glu Phe Tyr Gly
        595                 600                 605

cgg gag atc atg aac gtg gtg gcg tgt gag ggg acg gag aga gtg gag     1872
Arg Glu Ile Met Asn Val Val Ala Cys Glu Gly Thr Glu Arg Val Glu
    610                 615                 620

agg cca gag agt tat aag cag tgg cag gcg agg gcg atg aga gcc ggg     1920
Arg Pro Glu Ser Tyr Lys Gln Trp Gln Ala Arg Ala Met Arg Ala Gly
625                 630                 635                 640

ttt aga cag att ccg ctg gag aag gaa cta gtt cag aaa ctg aag ttg     1968
Phe Arg Gln Ile Pro Leu Glu Lys Glu Leu Val Gln Lys Leu Lys Leu
                645                 650                 655

atg gtg gaa agt gga tac aaa ccc aaa gag ttt gat gtt gat caa gat     2016
Met Val Glu Ser Gly Tyr Lys Pro Lys Glu Phe Asp Val Asp Gln Asp
            660                 665                 670

tgt cac tgg ttg ctt cag ggc tgg aaa ggt aga att gta tac ggt tca     2064
Cys His Trp Leu Leu Gln Gly Trp Lys Gly Arg Ile Val Tyr Gly Ser
        675                 680                 685

tct att tgg gtt cct ttc ttt ttc tat gtg ggc aga gca act agg gtt     2112
Ser Ile Trp Val Pro Phe Phe Phe Tyr Val Gly Arg Ala Thr Arg Val
    690                 695                 700

ttg atc atg gat cca aac ttc tct gaa tct cta aac ggc ttt gag tat     2160
Leu Ile Met Asp Pro Asn Phe Ser Glu Ser Leu Asn Gly Phe Glu Tyr
705                 710                 715                 720

ttt gat ggt aac cct aat ttg ctt act gat cca atg gaa gat cag tat     2208
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Phe Asp Gly Asn Pro Asn Leu Leu Thr Asp Pro Met Glu Asp Gln Tyr
                725                 730                 735

cca cca cca tct gat act ctg ttg aaa tac gtg agt gag att ctt atg     2256
Pro Pro Pro Ser Asp Thr Leu Leu Lys Tyr Val Ser Glu Ile Leu Met
            740                 745                 750

gaa gag agt aat gga gat tat aag caa tct atg ttc tat gat tca ttg     2304
Glu Glu Ser Asn Gly Asp Tyr Lys Gln Ser Met Phe Tyr Asp Ser Leu
        755                 760                 765

gct tta cga aaa act gaa gaa atg ttg cag caa gtc att act gat tct     2352
Ala Leu Arg Lys Thr Glu Glu Met Leu Gln Gln Val Ile Thr Asp Ser
    770                 775                 780

caa aat cag tcc ttt agt cct gct gat tca ttg att act aat tct tgg     2400
Gln Asn Gln Ser Phe Ser Pro Ala Asp Ser Leu Ile Thr Asn Ser Trp
785                 790                 795                 800

gat gca agc gga agc atc gat gaa tcg gct tat tcg gct gat ccg caa     2448
Asp Ala Ser Gly Ser Ile Asp Glu Ser Ala Tyr Ser Ala Asp Pro Gln
                805                 810                 815

cct gtg aat gaa att atg gtt aag agt atg ttt agt gat gca gaa tca     2496
Pro Val Asn Glu Ile Met Val Lys Ser Met Phe Ser Asp Ala Glu Ser
            820                 825                 830

gct tta cag ttt aag aaa ggg gtt gaa gaa gct agt aaa ttc ctt ccc     2544
Ala Leu Gln Phe Lys Lys Gly Val Glu Glu Ala Ser Lys Phe Leu Pro
        835                 840                 845

aat agt gat caa tgg gtt atc aat ctg gat atc gag aga tcc gaa agg     2592
Asn Ser Asp Gln Trp Val Ile Asn Leu Asp Ile Glu Arg Ser Glu Arg
    850                 855                 860

cgc gat tcg gtt aaa gaa gag atg gga ttg gat cag ttg aga gtt aag     2640
Arg Asp Ser Val Lys Glu Glu Met Gly Leu Asp Gln Leu Arg Val Lys
865                 870                 875                 880

aag aat cat gaa agg gat ttt gag gaa gtt agg agt agt aag caa ttt     2688
Lys Asn His Glu Arg Asp Phe Glu Glu Val Arg Ser Ser Lys Gln Phe
                885                 890                 895

gct agt aat gta gaa gat agt aag gtt aca gat atg ttt gat aag gtt     2736
Ala Ser Asn Val Glu Asp Ser Lys Val Thr Asp Met Phe Asp Lys Val
            900                 905                 910

ttg ctt ctt gac ggt gaa tgc gat ccg caa aca ttg tta gac agc gag     2784
Leu Leu Leu Asp Gly Glu Cys Asp Pro Gln Thr Leu Leu Asp Ser Glu
        915                 920                 925

att caa gcg att cgg agt agt aag aac ata gga gag aaa ggg aag aag     2832
Ile Gln Ala Ile Arg Ser Ser Lys Asn Ile Gly Glu Lys Gly Lys Lys
    930                 935                 940

aag aag aag aag aag agt caa gtg gtt gat ttt cgt aca ctt ctc act     2880
Lys Lys Lys Lys Lys Ser Gln Val Val Asp Phe Arg Thr Leu Leu Thr
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945                 950                 955                 960

cat tgt gca caa gcc att tcc aca gga gat aaa acc acg gct ctt gag     2928
His Cys Ala Gln Ala Ile Ser Thr Gly Asp Lys Thr Thr Ala Leu Glu
                965                 970                 975

ttt ctg tta cag ata agg caa cag tct tcg cct ctc ggt gac gcg ggg     2976
Phe Leu Leu Gln Ile Arg Gln Gln Ser Ser Pro Leu Gly Asp Ala Gly
            980                 985                 990

caa aga cta gct cat tgt ttc gct  aac gcg ctt gaa gct  cgt cta cag   3024
Gln Arg Leu Ala His Cys Phe Ala  Asn Ala Leu Glu Ala  Arg Leu Gln
        995                 1000                1005

gga agt  acc ggt cct atg atc  cag act tat tac aat  gct tta acc      3069
Gly Ser  Thr Gly Pro Met Ile  Gln Thr Tyr Tyr Asn  Ala Leu Thr
    1010                1015                1020

tcg tcg  ttg aag gat act gct  gcg gat aca att aga  gcg tat cga      3114
Ser Ser  Leu Lys Asp Thr Ala  Ala Asp Thr Ile Arg  Ala Tyr Arg
    1025                1030                1035

gtt tat  ctt tct tcg tct ccg  ttt gtt acc ttg atg  tat ttc ttc      3159
Val Tyr  Leu Ser Ser Ser Pro  Phe Val Thr Leu Met  Tyr Phe Phe
    1040                1045                1050

tcc atc  tgg atg att ctt gat  gtg gct aaa gat gct  cct gtt ctt      3204
Ser Ile  Trp Met Ile Leu Asp  Val Ala Lys Asp Ala  Pro Val Leu
    1055                1060                1065

cat ata  gtt gat ttt ggg att  cta tac ggg ttt caa  tgg ccg atg      3249
His Ile  Val Asp Phe Gly Ile  Leu Tyr Gly Phe Gln  Trp Pro Met
    1070                1075                1080

ttt att  cag tct ata tca gat  cga aaa gat gta ccg  cgg aag ctg      3294
Phe Ile  Gln Ser Ile Ser Asp  Arg Lys Asp Val Pro  Arg Lys Leu
    1085                1090                1095

cgg att  act ggt atc gag ctt  cct cag tgc ggg ttt  cgg ccc gcg      3339
Arg Ile  Thr Gly Ile Glu Leu  Pro Gln Cys Gly Phe  Arg Pro Ala
    1100                1105                1110

gag cga  ata gag gag aca gga  cgg aga ttg gct gag  tat tgt aaa      3384
Glu Arg  Ile Glu Glu Thr Gly  Arg Arg Leu Ala Glu  Tyr Cys Lys
    1115                1120                1125

cgg ttt  aat gtt ccg ttt gag  tac aaa gcc att gcg  tct cag aac      3429
Arg Phe  Asn Val Pro Phe Glu  Tyr Lys Ala Ile Ala  Ser Gln Asn
    1130                1135                1140

tgg gaa  aca atc cgg ata gaa  gat ctc gat ata cga  cca aac gaa      3474
Trp Glu  Thr Ile Arg Ile Glu  Asp Leu Asp Ile Arg  Pro Asn Glu
    1145                1150                1155

gtc tta  gcg gtt aat gct gga  ctt aga ctc aag aac  ctt caa gat      3519
Val Leu  Ala Val Asn Ala Gly  Leu Arg Leu Lys Asn  Leu Gln Asp
    1160                1165                1170
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gaa aca  gga agc gaa gag aat  tgc ccg aga gat gct  gtc ttg aag      3564
Glu Thr  Gly Ser Glu Glu Asn  Cys Pro Arg Asp Ala  Val Leu Lys
    1175                 1180                 1185

cta ata  aga aac atg aac ccg  gac gtt ttc atc cac  gcg att gtc      3609
Leu Ile  Arg Asn Met Asn Pro  Asp Val Phe Ile His  Ala Ile Val
    1190                 1195                 1200

aac ggt  tca ttc aac gca ccc  ttc ttt atc tcg cgg  ttt aaa gaa      3654
Asn Gly  Ser Phe Asn Ala Pro  Phe Phe Ile Ser Arg  Phe Lys Glu
    1205                 1210                 1215

gcg gtt  tac cat tac tcc gct  ctc ttc gac atg ttt  gat tcg acg      3699
Ala Val  Tyr His Tyr Ser Ala  Leu Phe Asp Met Phe  Asp Ser Thr
    1220                 1225                 1230

ttg cct  cgg gat aac aaa gag  agg att agg ttc gag  agg gag ttt      3744
Leu Pro  Arg Asp Asn Lys Glu  Arg Ile Arg Phe Glu  Arg Glu Phe
    1235                 1240                 1245

tac ggg  aga gag gct atg aac  gtg ata gcg tgc gag  gaa gct gat      3789
Tyr Gly  Arg Glu Ala Met Asn  Val Ile Ala Cys Glu  Glu Ala Asp
    1250                 1255                 1260

cga gtg  gag agg cct gag act  tac agg caa tgg cag  gtt aga atg      3834
Arg Val  Glu Arg Pro Glu Thr  Tyr Arg Gln Trp Gln  Val Arg Met
    1265                 1270                 1275

gtt aga  gcc ggg ttt aag cag  aaa acg att aag cct  gag ctg gta      3879
Val Arg  Ala Gly Phe Lys Gln  Lys Thr Ile Lys Pro  Glu Leu Val
    1280                 1285                 1290

gag ttg  ttt aga gga aag ctg  aag aaa tgg cgt tac  cat aaa gac      3924
Glu Leu  Phe Arg Gly Lys Leu  Lys Lys Trp Arg Tyr  His Lys Asp
    1295                 1300                 1305

ttt gtg  gtt gat gaa aat agt  aaa tgg ttg tta caa  ggc tgg aaa      3969
Phe Val  Val Asp Glu Asn Ser  Lys Trp Leu Leu Gln  Gly Trp Lys
    1310                 1315                 1320

ggt cga  act ctc tat gct tct  tct tgt tgg gtt cct  gcc tag          4011
Gly Arg  Thr Leu Tyr Ala Ser  Ser Cys Trp Val Pro  Ala
    1325                 1330                 1335
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Met Gly Ser Tyr Ser Ala Gly Phe Pro Gly Ser Leu Asp Trp Phe Asp
1               5                  10                  15

Phe Pro Gly Leu Gly Asn Gly Ser Tyr Leu Asn Asp Gln Pro Leu Leu
            20                  25                  30

Asp Ile Gly Ser Val Pro Pro Pro Leu Asp Pro Tyr Pro Gln Gln Asn
```

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      35                  40                  45

Leu Ala Ser Ala Asp Ala Asp Phe Ser Asp Ser Val Leu Lys Tyr Ile
    50                  55                  60

Ser Gln Val Leu Met Glu Glu Asp Met Glu Asp Lys Pro Cys Met Phe
65                  70                  75                  80

His Asp Ala Leu Ser Leu Gln Ala Ala Glu Lys Ser Leu Tyr Glu Ala
                85                  90                  95

Leu Gly Glu Lys Tyr Pro Val Asp Asp Ser Asp Gln Pro Leu Thr Thr
            100                 105                 110

Thr Thr Ser Leu Ala Gln Leu Val Ser Ser Pro Gly Gly Ser Ser Tyr
        115                 120                 125

Ala Ser Ser Thr Thr Thr Thr Ser Ser Asp Ser Gln Trp Ser Phe Asp
    130                 135                 140

Cys Leu Glu Asn Asn Arg Pro Ser Ser Trp Leu Gln Thr Pro Ile Pro
145                 150                 155                 160

Ser Asn Phe Ile Phe Gln Ser Thr Ser Thr Arg Ala Ser Ser Gly Asn
                165                 170                 175

Ala Val Phe Gly Ser Ser Phe Ser Gly Asp Leu Val Ser Asn Met Phe
            180                 185                 190

Asn Asp Thr Asp Leu Ala Leu Gln Phe Lys Lys Gly Met Glu Glu Ala
        195                 200                 205

Ser Lys Phe Leu Pro Lys Ser Ser Gln Leu Val Ile Asp Asn Ser Val
    210                 215                 220

Pro Asn Arg Leu Thr Gly Lys Lys Ser His Trp Arg Glu Glu Glu His
225                 230                 235                 240

Leu Thr Glu Glu Arg Ser Lys Lys Gln Ser Ala Ile Tyr Val Asp Glu
                245                 250                 255

Thr Asp Glu Leu Thr Asp Met Phe Asp Asn Ile Leu Ile Phe Gly Glu
            260                 265                 270
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Ala Lys Glu Gln Pro Val Cys Ile Leu Asn Glu Ser Phe Pro Lys Glu
275 280 285

Pro Ala Lys Ala Ser Thr Phe Ser Lys Ser Pro Lys Gly Glu Lys Pro
290 295 300

Glu Ala Ser Gly Asn Ser Tyr Thr Lys Glu Thr Pro Asp Leu Arg Thr
305 310 315 320

Met Leu Val Ser Cys Ala Gln Ala Val Ser Ile Asn Asp Arg Arg Thr
325 330 335

Ala Asp Glu Leu Leu Ser Arg Ile Arg Gln His Ser Ser Ser Tyr Gly
340 345 350

Asp Gly Thr Glu Arg Leu Ala His Tyr Phe Ala Asn Ser Leu Glu Ala
355 360 365

Arg Leu Ala Gly Ile Gly Thr Gln Val Tyr Thr Ala Leu Ser Ser Lys
370 375 380

Lys Thr Ser Thr Ser Asp Met Leu Lys Ala Tyr Gln Thr Tyr Ile Ser
385 390 395 400

Val Cys Pro Phe Lys Lys Ile Ala Ile Ile Phe Ala Asn His Ser Ile
405 410 415

Met Arg Leu Ala Ser Ser Ala Asn Ala Lys Thr Ile His Ile Ile Asp
420 425 430

Phe Gly Ile Ser Asp Gly Phe Gln Trp Pro Ser Leu Ile His Arg Leu
435 440 445

Ala Trp Arg Arg Gly Ser Ser Cys Lys Leu Arg Ile Thr Gly Ile Glu
450 455 460

Leu Pro Gln Arg Gly Phe Arg Pro Ala Glu Gly Val Ile Glu Thr Gly
465 470 475 480

Arg Arg Leu Ala Lys Tyr Cys Gln Lys Phe Asn Ile Pro Phe Glu Tyr
485 490 495

Asn Ala Ile Ala Gln Lys Trp Glu Ser Ile Lys Leu Glu Asp Leu Lys
500 505 510

Leu Lys Glu Gly Glu Phe Val Ala Val Asn Ser Leu Phe Arg Phe Arg
515 520 525

Asn Leu Leu Asp Glu Thr Val Ala Val His Ser Pro Arg Asp Thr Val
530 535 540

Leu Lys Leu Ile Arg Lys Ile Lys Pro Asp Val Phe Ile Pro Gly Ile
545 550 555 560

Leu Ser Gly Ser Tyr Asn Ala Pro Phe Phe Val Thr Arg Phe Arg Glu
565 570 575

Val Leu Phe His Tyr Ser Ser Leu Phe Asp Met Cys Asp Thr Asn Leu
580 585 590

Thr Arg Glu Asp Pro Met Arg Val Met Phe Glu Lys Glu Phe Tyr Gly
595 600 605

Arg Glu Ile Met Asn Val Val Ala Cys Glu Gly Thr Glu Arg Val Glu
610 615 620

Arg Pro Glu Ser Tyr Lys Gln Trp Gln Ala Arg Ala Met Arg Ala Gly
625 630 635 640

Phe Arg Gln Ile Pro Leu Glu Lys Glu Leu Val Gln Lys Leu Lys Leu
645 650 655

Met Val Glu Ser Gly Tyr Lys Pro Lys Glu Phe Asp Val Asp Gln Asp
660 665 670

Cys His Trp Leu Leu Gln Gly Trp Lys Gly Arg Ile Val Tyr Gly Ser
675 680 685

Ser Ile Trp Val Pro Phe Phe Phe Tyr Val Gly Arg Ala Thr Arg Val
690 695 700

Leu Ile Met Asp Pro Asn Phe Ser Glu Ser Leu Asn Gly Phe Glu Tyr
705 710 715 720

Phe Asp Gly Asn Pro Asn Leu Leu Thr Asp Pro Met Glu Asp Gln Tyr
725 730 735

Pro Pro Pro Ser Asp Thr Leu Leu Lys Tyr Val Ser Glu Ile Leu Met
740 745 750

Glu Glu Ser Asn Gly Asp Tyr Lys Gln Ser Met Phe Tyr Asp Ser Leu
755 760 765

Ala Leu Arg Lys Thr Glu Glu Met Leu Gln Gln Val Ile Thr Asp Ser
770 775 780

Gln Asn Gln Ser Phe Ser Pro Ala Asp Ser Leu Ile Thr Asn Ser Trp
785 790 795 800

Asp Ala Ser Gly Ser Ile Asp Glu Ser Ala Tyr Ser Ala Asp Pro Gln
805 810 815

Pro Val Asn Glu Ile Met Val Lys Ser Met Phe Ser Asp Ala Glu Ser
820 825 830

Ala Leu Gln Phe Lys Lys Gly Val Glu Glu Ala Ser Lys Phe Leu Pro
835 840 845

Asn Ser Asp Gln Trp Val Ile Asn Leu Asp Ile Glu Arg Ser Glu Arg
850 855 860

Arg Asp Ser Val Lys Glu Glu Met Gly Leu Asp Gln Leu Arg Val Lys
865 870 875 880

Lys Asn His Glu Arg Asp Phe Glu Glu Val Arg Ser Ser Lys Gln Phe
885 890 895

Ala Ser Asn Val Glu Asp Ser Lys Val Thr Asp Met Phe Asp Lys Val
900 905 910

Leu Leu Leu Asp Gly Glu Cys Asp Pro Gln Thr Leu Leu Asp Ser Glu
915 920 925

Ile Gln Ala Ile Arg Ser Ser Lys Asn Ile Gly Glu Lys Gly Lys Lys
930 935 940

Lys Lys Lys Lys Lys Ser Gln Val Val Asp Phe Arg Thr Leu Leu Thr

945 950 955 960

His Cys Ala Gln Ala Ile Ser Thr Gly Asp Lys Thr Thr Ala Leu Glu
965 970 975

Phe Leu Leu Gln Ile Arg Gln Gln Ser Ser Pro Leu Gly Asp Ala Gly
980 985 990

Gln Arg Leu Ala His Cys Phe Ala Asn Ala Leu Glu Ala Arg Leu Gln
995 1000 1005

Gly Ser Thr Gly Pro Met Ile Gln Thr Tyr Tyr Asn Ala Leu Thr
1010 1015 1020

Ser Ser Leu Lys Asp Thr Ala Ala Asp Thr Ile Arg Ala Tyr Arg
1025 1030 1035

Val Tyr Leu Ser Ser Ser Pro Phe Val Thr Leu Met Tyr Phe Phe
1040 1045 1050

Ser Ile Trp Met Ile Leu Asp Val Ala Lys Asp Ala Pro Val Leu
1055 1060 1065

His Ile Val Asp Phe Gly Ile Leu Tyr Gly Phe Gln Trp Pro Met
1070 1075 1080

Phe Ile Gln Ser Ile Ser Asp Arg Lys Asp Val Pro Arg Lys Leu
1085 1090 1095

Arg Ile Thr Gly Ile Glu Leu Pro Gln Cys Gly Phe Arg Pro Ala
1100 1105 1110

Glu Arg Ile Glu Glu Thr Gly Arg Arg Leu Ala Glu Tyr Cys Lys
1115 1120 1125

Arg Phe Asn Val Pro Phe Glu Tyr Lys Ala Ile Ala Ser Gln Asn
1130 1135 1140

Trp Glu Thr Ile Arg Ile Glu Asp Leu Asp Ile Arg Pro Asn Glu
1145 1150 1155

Val Leu Ala Val Asn Ala Gly Leu Arg Leu Lys Asn Leu Gln Asp
1160 1165 1170

Glu Thr Gly Ser Glu Glu Asn Cys Pro Arg Asp Ala Val Leu Lys
1175 1180 1185

Leu Ile Arg Asn Met Asn Pro Asp Val Phe Ile His Ala Ile Val
1190 1195 1200

Asn Gly Ser Phe Asn Ala Pro Phe Phe Ile Ser Arg Phe Lys Glu
1205 1210 1215

Ala Val Tyr His Tyr Ser Ala Leu Phe Asp Met Phe Asp Ser Thr
1220 1225 1230

Leu Pro Arg Asp Asn Lys Glu Arg Ile Arg Phe Glu Arg Glu Phe
1235 1240 1245

Tyr Gly Arg Glu Ala Met Asn Val Ile Ala Cys Glu Glu Ala Asp
1250 1255 1260

Arg Val Glu Arg Pro Glu Thr Tyr Arg Gln Trp Gln Val Arg Met
1265 1270 1275

Val Arg Ala Gly Phe Lys Gln Lys Thr Ile Lys Pro Glu Leu Val
1280 1285 1290

Glu Leu Phe Arg Gly Lys Leu Lys Lys Trp Arg Tyr His Lys Asp
1295 1300 1305

Phe Val Val Asp Glu Asn Ser Lys Trp Leu Leu Gln Gly Trp Lys
1310 1315 1320

Gly Arg Thr Leu Tyr Ala Ser Ser Cys Trp Val Pro Ala
1325 1330 1335

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Met Met Ser Thr Val Pro Ala Phe Thr Phe Thr
1 5 10

gaa ccg ggt ttg gtt aac caa tta tcg gat ttc cag acc gga ttc act 100
Glu Pro Gly Leu Val Asn Gln Leu Ser Asp Phe Gln Thr Gly Phe Thr
15 20 25

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cct tgg gaa ttg aac tgc tcc gat ctc ttc tct aca atc cat ctc gaa      148
Pro Trp Glu Leu Asn Cys Ser Asp Leu Phe Ser Thr Ile His Leu Glu
        30                  35                  40

ccg gtc gta ccg agt cct tgt tct ggt gaa tcc gat gcc ggt tct gtc      196
Pro Val Val Pro Ser Pro Cys Ser Gly Glu Ser Asp Ala Gly Ser Val
    45                  50                  55

aaa att aac acc gat ttt aac ggt ttt gac gaa tcg tgt atc ggt tcc      244
Lys Ile Asn Thr Asp Phe Asn Gly Phe Asp Glu Ser Cys Ile Gly Ser
60                  65                  70                  75

atc aaa act aac tcc ggt tct gat gat tcc aac ctt ttc cac ggc gta      292
Ile Lys Thr Asn Ser Gly Ser Asp Asp Ser Asn Leu Phe His Gly Val
                80                  85                  90

ccg agt cct caa tcc gac gaa ttg gac tca aaa aac acg aaa atc cga      340
Pro Ser Pro Gln Ser Asp Glu Leu Asp Ser Lys Asn Thr Lys Ile Arg
            95                  100                 105

agt aac gcc acg aat cat aac cgg aac aaa ttg aac cgg tcg gtt ttg      388
Ser Asn Ala Thr Asn His Asn Arg Asn Lys Leu Asn Arg Ser Val Leu
        110                 115                 120

cag gtg act gac gac cgt aaa cgc aaa cgg atg gaa tca aac cga gaa      436
Gln Val Thr Asp Asp Arg Lys Arg Lys Arg Met Glu Ser Asn Arg Glu
    125                 130                 135

tca gcg aag cgg tcg agg atg cgt aaa caa aga cac att gat aat tta      484
Ser Ala Lys Arg Ser Arg Met Arg Lys Gln Arg His Ile Asp Asn Leu
140                 145                 150                 155

aaa gac gaa gca aat cgt ctc ggt tta gaa aac cgg gaa ctc gca aac      532
Lys Asp Glu Ala Asn Arg Leu Gly Leu Glu Asn Arg Glu Leu Ala Asn
                160                 165                 170

cgg ctt cga att gtt ttg tac aac atc gca tta atg tgt acg gac aac      580
Arg Leu Arg Ile Val Leu Tyr Asn Ile Ala Leu Met Cys Thr Asp Asn
            175                 180                 185

aat cag ctt ttg tcg gaa caa gag att ctc aga cgg aga ttc ttg gag      628
Asn Gln Leu Leu Ser Glu Gln Glu Ile Leu Arg Arg Arg Phe Leu Glu
        190                 195                 200

atg agg cag att ttg att ttc aga cag ctt cag ctg aat cca tca ttg      676
Met Arg Gln Ile Leu Ile Phe Arg Gln Leu Gln Leu Asn Pro Ser Leu
    205                 210                 215

atc atc aat cat cat cat atg att tga aagaaaaaaa aa                   715
Ile Ile Asn His His His Met Ile
220                 225
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Met Met Ser Thr Val Pro Ala Phe Thr Phe Thr Glu Pro Gly Leu Val
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1               5                   10                  15

Asn Gln Leu Ser Asp Phe Gln Thr Gly Phe Thr Pro Trp Glu Leu Asn
            20                  25                  30

Cys Ser Asp Leu Phe Ser Thr Ile His Leu Glu Pro Val Val Pro Ser
        35                  40                  45

Pro Cys Ser Gly Glu Ser Asp Ala Gly Ser Val Lys Ile Asn Thr Asp
    50                  55                  60

Phe Asn Gly Phe Asp Glu Ser Cys Ile Gly Ser Ile Lys Thr Asn Ser
65                  70                  75                  80

Gly Ser Asp Asp Ser Asn Leu Phe His Gly Val Pro Ser Pro Gln Ser
                85                  90                  95

Asp Glu Leu Asp Ser Lys Asn Thr Lys Ile Arg Ser Asn Ala Thr Asn
            100                 105                 110

His Asn Arg Asn Lys Leu Asn Arg Ser Val Leu Gln Val Thr Asp Asp
        115                 120                 125

Arg Lys Arg Lys Arg Met Glu Ser Asn Arg Glu Ser Ala Lys Arg Ser
    130                 135                 140

Arg Met Arg Lys Gln Arg His Ile Asp Asn Leu Lys Asp Glu Ala Asn
145                 150                 155                 160

Arg Leu Gly Leu Glu Asn Arg Glu Leu Ala Asn Arg Leu Arg Ile Val
                165                 170                 175

Leu Tyr Asn Ile Ala Leu Met Cys Thr Asp Asn Asn Gln Leu Leu Ser
            180                 185                 190

Glu Gln Glu Ile Leu Arg Arg Arg Phe Leu Glu Met Arg Gln Ile Leu
        195                 200                 205

Ile Phe Arg Gln Leu Gln Leu Asn Pro Ser Leu Ile Ile Asn His His
    210                 215                 220

His Met Ile
225
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tttaatgctt ctctttttt acttttccaa gtctctgaat attcaaagta tatatctttt 180

gttttcaaac ttttgcagaa ttgtcttcaa gcttccaaat ttcagttaaa ggtctcaact 240

ttgcagaatt ttcctctaaa ggttcagact ttggggtaaa ggtgtcaact ttggcg atg 299
Met
1

ggt ctt gac gga aac aat ggt gga ggg gtt tgg tta aac ggt ggt ggt 347
Gly Leu Asp Gly Asn Asn Gly Gly Gly Val Trp Leu Asn Gly Gly Gly
5 10 15

gga gaa agg gaa gag aac gag gaa ggt tca tgg gga agg aat caa gaa 395
Gly Glu Arg Glu Glu Asn Glu Glu Gly Ser Trp Gly Arg Asn Gln Glu
20 25 30

gat ggt tct tct cag ttt aag cct atg ctt gaa ggt gat tgg ttt agt 443
Asp Gly Ser Ser Gln Phe Lys Pro Met Leu Glu Gly Asp Trp Phe Ser
35 40 45

agt aac caa cca cat cca caa gat ctt cag atg tta cag aat cag cca 491
Ser Asn Gln Pro His Pro Gln Asp Leu Gln Met Leu Gln Asn Gln Pro
50 55 60 65

gat ttc aga tac ttt ggt ggt ttt cct ttt aac cct aat gat aat ctt 539
Asp Phe Arg Tyr Phe Gly Gly Phe Pro Phe Asn Pro Asn Asp Asn Leu
70 75 80

ctt ctt caa cac tct att gat tct tct tct tct tgt tct cct tct caa 587
Leu Leu Gln His Ser Ile Asp Ser Ser Ser Ser Cys Ser Pro Ser Gln
85 90 95

gct ttt agt ctt gac cct tct cag caa aat cag ttc ttg tca act aac 635
Ala Phe Ser Leu Asp Pro Ser Gln Gln Asn Gln Phe Leu Ser Thr Asn
100 105 110

aac aac aag ggt tgt ctt ctc aat gtt cct tct tct gca aac cct ttt 683
Asn Asn Lys Gly Cys Leu Leu Asn Val Pro Ser Ser Ala Asn Pro Phe
115 120 125

gat aat gct ttt gag ttt ggc tct gaa tct ggt ttt ctt aac caa atc 731
Asp Asn Ala Phe Glu Phe Gly Ser Glu Ser Gly Phe Leu Asn Gln Ile
130 135 140 145

cat gct cct att tcg atg ggg ttt ggt tct ttg aca caa ttg ggg aac 779
His Ala Pro Ile Ser Met Gly Phe Gly Ser Leu Thr Gln Leu Gly Asn
150 155 160

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agg gat ttg agt tct gtt cct gat ttc ttg tct gct cgg tca ctt ctt      827
Arg Asp Leu Ser Ser Val Pro Asp Phe Leu Ser Ala Arg Ser Leu Leu
            165                 170                 175

gcg ccg gaa agc aac aac aac aac aca atg ttg tgt ggt ggt ttc aca      875
Ala Pro Glu Ser Asn Asn Asn Asn Thr Met Leu Cys Gly Gly Phe Thr
        180                 185                 190

gct ccg ttg gag ttg gaa ggt ttt ggt agt cct gct aat ggt ggt ttt      923
Ala Pro Leu Glu Leu Glu Gly Phe Gly Ser Pro Ala Asn Gly Gly Phe
    195                 200                 205

gtt ggg aac aga gcg aaa gtt ctg aag cct tta gag gtg tta gca tcg      971
Val Gly Asn Arg Ala Lys Val Leu Lys Pro Leu Glu Val Leu Ala Ser
210                 215                 220                 225

tct ggt gca cag cct act ctg ttc cag aaa cgt gca gct atg cgt cag     1019
Ser Gly Ala Gln Pro Thr Leu Phe Gln Lys Arg Ala Ala Met Arg Gln
                230                 235                 240

agc tct gga agc aaa atg gga aat tcg gag agt tcg gga atg agg agg     1067
Ser Ser Gly Ser Lys Met Gly Asn Ser Glu Ser Ser Gly Met Arg Arg
            245                 250                 255

ttt agt gat gat gga gat atg gat gag act ggg att gag gtt tct ggg     1115
Phe Ser Asp Asp Gly Asp Met Asp Glu Thr Gly Ile Glu Val Ser Gly
        260                 265                 270

ttg aac tat gag tct gat gag ata aat gag agc ggt aaa gcg gct gag     1163
Leu Asn Tyr Glu Ser Asp Glu Ile Asn Glu Ser Gly Lys Ala Ala Glu
    275                 280                 285

agt gtt cag att gga gga gga gga aag ggt aag aag aaa ggt atg cct     1211
Ser Val Gln Ile Gly Gly Gly Gly Lys Gly Lys Lys Lys Gly Met Pro
290                 295                 300                 305

gct aag aat ctg atg gct gag agg aga agg agg aag aag ctt aat gat     1259
Ala Lys Asn Leu Met Ala Glu Arg Arg Arg Arg Lys Lys Leu Asn Asp
                310                 315                 320

agg ctt tat atg ctt aga tca gtt gtc ccc aag atc agc aaa atg gat     1307
Arg Leu Tyr Met Leu Arg Ser Val Val Pro Lys Ile Ser Lys Met Asp
            325                 330                 335

aga gca tca ata ctt gga gat gca att gat tat ctg aag gaa ctt cta     1355
Arg Ala Ser Ile Leu Gly Asp Ala Ile Asp Tyr Leu Lys Glu Leu Leu
        340                 345                 350

caa agg atc aat gat ctt cac aat gaa ctt gag tca act cct cct gga     1403
Gln Arg Ile Asn Asp Leu His Asn Glu Leu Glu Ser Thr Pro Pro Gly
    355                 360                 365

tct ttg cct cca act tca tca agc ttc cat ccg ttg aca cct aca ccg     1451
Ser Leu Pro Pro Thr Ser Ser Ser Phe His Pro Leu Thr Pro Thr Pro
370                 375                 380                 385
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caa act ctt tct tgt cgt gtc aag gaa gag ttg tgt ccc tct tct tta     1499
Gln Thr Leu Ser Cys Arg Val Lys Glu Glu Leu Cys Pro Ser Ser Leu
                390                 395                 400

cca agt cct aaa ggc cag caa gct aga gtt gag gtt aga tta agg gaa     1547
Pro Ser Pro Lys Gly Gln Gln Ala Arg Val Glu Val Arg Leu Arg Glu
            405                 410                 415

gga aga gca gtg aac att cat atg ttc tgt ggt cgt aga ccg ggt ctg     1595
Gly Arg Ala Val Asn Ile His Met Phe Cys Gly Arg Arg Pro Gly Leu
        420                 425                 430

ttg ctc gct acc atg aaa gct ttg gat aat ctt gga ttg gat gtt cag     1643
Leu Leu Ala Thr Met Lys Ala Leu Asp Asn Leu Gly Leu Asp Val Gln
    435                 440                 445

caa gct gtg atc agc tgt ttt aat ggg ttt gcc ttg gat gtt ttc cgc     1691
Gln Ala Val Ile Ser Cys Phe Asn Gly Phe Ala Leu Asp Val Phe Arg
450                 455                 460                 465

gct gag caa tgc caa gaa gga caa gag ata ctg cct gat caa atc aaa     1739
Ala Glu Gln Cys Gln Glu Gly Gln Glu Ile Leu Pro Asp Gln Ile Lys
                470                 475                 480

gca gtg ctt ttc gat aca gca ggg tat gct ggt atg atc tga             1781
Ala Val Leu Phe Asp Thr Ala Gly Tyr Ala Gly Met Ile
            485                 490

tctgatcctg acttcgagtc cattaagcat ctgttgaagc agagctagaa gaactaagtc   1841

cctttaaatc tgcaattttc ttctcaactt tttttcttat gtcataactt caatctaagc   1901

atgtaatgca attgcaaatg agagttgttt ttaaattaag cttttgagaa cttgaggttg   1961

ttgttgttgg atacataact tcaacctttt attagcaatg ttaacttcca tttatgtttc   2021

atctt                                                               2026
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1               5                   10                  15

Gly Gly Glu Arg Glu Glu Asn Glu Glu Gly Ser Trp Gly Arg Asn Gln
            20                  25                  30

Glu Asp Gly Ser Ser Gln Phe Lys Pro Met Leu Glu Gly Asp Trp Phe
        35                  40                  45

Ser Ser Asn Gln Pro His Pro Gln Asp Leu Gln Met Leu Gln Asn Gln
    50                  55                  60
```

Pro Asp Phe Arg Tyr Phe Gly Gly Phe Pro Phe Asn Pro Asn Asp Asn
65 70 75 80

Leu Leu Leu Gln His Ser Ile Asp Ser Ser Ser Ser Cys Ser Pro Ser
85 90 95

Gln Ala Phe Ser Leu Asp Pro Ser Gln Gln Asn Gln Phe Leu Ser Thr
100 105 110

Asn Asn Asn Lys Gly Cys Leu Leu Asn Val Pro Ser Ser Ala Asn Pro
115 120 125

Phe Asp Asn Ala Phe Glu Phe Gly Ser Glu Ser Gly Phe Leu Asn Gln
130 135 140

Ile His Ala Pro Ile Ser Met Gly Phe Gly Ser Leu Thr Gln Leu Gly
145 150 155 160

Asn Arg Asp Leu Ser Ser Val Pro Asp Phe Leu Ser Ala Arg Ser Leu
165 170 175

Leu Ala Pro Glu Ser Asn Asn Asn Asn Thr Met Leu Cys Gly Gly Phe
180 185 190

Thr Ala Pro Leu Glu Leu Glu Gly Phe Gly Ser Pro Ala Asn Gly Gly
195 200 205

Phe Val Gly Asn Arg Ala Lys Val Leu Lys Pro Leu Glu Val Leu Ala
210 215 220

Ser Ser Gly Ala Gln Pro Thr Leu Phe Gln Lys Arg Ala Ala Met Arg
225 230 235 240

Gln Ser Ser Gly Ser Lys Met Gly Asn Ser Glu Ser Ser Gly Met Arg
245 250 255

Arg Phe Ser Asp Asp Gly Asp Met Asp Glu Thr Gly Ile Glu Val Ser
260 265 270

Gly Leu Asn Tyr Glu Ser Asp Glu Ile Asn Glu Ser Gly Lys Ala Ala
275 280 285

Glu Ser Val Gln Ile Gly Gly Gly Gly Lys Gly Lys Lys Lys Gly Met

290 295 300

Pro Ala Lys Asn Leu Met Ala Glu Arg Arg Arg Arg Lys Lys Leu Asn
305 310 315 320

Asp Arg Leu Tyr Met Leu Arg Ser Val Val Pro Lys Ile Ser Lys Met
325 330 335

Asp Arg Ala Ser Ile Leu Gly Asp Ala Ile Asp Tyr Leu Lys Glu Leu
340 345 350

Leu Gln Arg Ile Asn Asp Leu His Asn Glu Leu Glu Ser Thr Pro Pro
355 360 365

Gly Ser Leu Pro Pro Thr Ser Ser Ser Phe His Pro Leu Thr Pro Thr
370 375 380

Pro Gln Thr Leu Ser Cys Arg Val Lys Glu Glu Leu Cys Pro Ser Ser
385 390 395 400

Leu Pro Ser Pro Lys Gly Gln Gln Ala Arg Val Glu Val Arg Leu Arg
405 410 415

Glu Gly Arg Ala Val Asn Ile His Met Phe Cys Gly Arg Arg Pro Gly
420 425 430

Leu Leu Leu Ala Thr Met Lys Ala Leu Asp Asn Leu Gly Leu Asp Val
435 440 445

Gln Gln Ala Val Ile Ser Cys Phe Asn Gly Phe Ala Leu Asp Val Phe
450 455 460

Arg Ala Glu Gln Cys Gln Glu Gly Gln Glu Ile Leu Pro Asp Gln Ile
465 470 475 480

Lys Ala Val Leu Phe Asp Thr Ala Gly Tyr Ala Gly Met Ile
485 490

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ctcatccgcc attttcgttg acttttgaa gcatttctcg aattgacttt gttcttcaca    180

ttgattcatt agaatgttct ttcataaagt ttggatcttt tcttcagggc ttgattaatt    240

tcatatctat gatcttctct gtattgtttt tgatccaatc acttctcaaa atttgatcct    300

tgtcattgga tttagattta gggtttttgt atccttgggg atttgaagat caaaaacaga    360

gtctttgagt gatacttctg gggaacaaa atg gct gca act gca ata gag cca      413
                                Met Ala Ala Thr Ala Ile Glu Pro
                                1               5

tct tca tct ata agt ttc aca tct tct cac tta tca aac cct tct cct      461
Ser Ser Ser Ile Ser Phe Thr Ser Ser His Leu Ser Asn Pro Ser Pro
    10                  15                  20

gtt gtt act act tat cac tca gct gct aat ctt gaa gag ctc agc tct      509
Val Val Thr Thr Tyr His Ser Ala Ala Asn Leu Glu Glu Leu Ser Ser
25                  30                  35                  40

aac ttg gag cag ctt ctc act aat cca gat tgc gat tac act gac gca      557
Asn Leu Glu Gln Leu Leu Thr Asn Pro Asp Cys Asp Tyr Thr Asp Ala
                45                  50                  55

gag atc atc att gaa gaa gaa gct aac cct cgg aag ctt cgt aac tat      605
Glu Ile Ile Ile Glu Glu Glu Ala Asn Pro Arg Lys Leu Arg Asn Tyr
            60                  65                  70

gtt gag aag tca cta gta gag aat gtt ctt cct atc ctc tta gtt gcg      653
Val Glu Lys Ser Leu Val Glu Asn Val Leu Pro Ile Leu Leu Val Ala
        75                  80                  85

ttt cat tgt gat ttg aca cag ctt ctt gat caa tgc att gag aga gtg      701
Phe His Cys Asp Leu Thr Gln Leu Leu Asp Gln Cys Ile Glu Arg Val
    90                  95                  100

gcg aga tca gac tta gac aga ttc tgt atc gaa aag gag ctt cct tta      749
Ala Arg Ser Asp Leu Asp Arg Phe Cys Ile Glu Lys Glu Leu Pro Leu
105                 110                 115                 120

gaa gta ttg gaa aaa atc aaa cag ctt cga gtt aag tcg gtg aac ata      797
Glu Val Leu Glu Lys Ile Lys Gln Leu Arg Val Lys Ser Val Asn Ile
                125                 130                 135

ccc gag gtg gag gat aaa tcg ata gag aga aca ggg aaa gta ctc aag      845
Pro Glu Val Glu Asp Lys Ser Ile Glu Arg Thr Gly Lys Val Leu Lys
            140                 145                 150

gca ttg gat tca gat gat gta gaa ctc gtg aag ctt ctt ttg act gag      893
Ala Leu Asp Ser Asp Asp Val Glu Leu Val Lys Leu Leu Leu Thr Glu
        155                 160                 165

tca gat ata act cta gac caa gcc aat ggt cta cat tat gca gtg gca      941
Ser Asp Ile Thr Leu Asp Gln Ala Asn Gly Leu His Tyr Ala Val Ala
    170                 175                 180
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tac agt gat ccg aaa gtt gtg aca cag gtt ctt gat cta gat atg gct      989
Tyr Ser Asp Pro Lys Val Val Thr Gln Val Leu Asp Leu Asp Met Ala
185                 190                 195                 200

gat gtt aat ttc aga aat tcc agg ggg tat acg gtt ctt cat att gct     1037
Asp Val Asn Phe Arg Asn Ser Arg Gly Tyr Thr Val Leu His Ile Ala
                205                 210                 215

gct atg cgt aga gag cca aca att atc ata cca ctt att caa aaa gga     1085
Ala Met Arg Arg Glu Pro Thr Ile Ile Ile Pro Leu Ile Gln Lys Gly
            220                 225                 230

gct aat gct tca gat ttc acg ttt gat gga cgc agt gcg gta aat ata     1133
Ala Asn Ala Ser Asp Phe Thr Phe Asp Gly Arg Ser Ala Val Asn Ile
        235                 240                 245

tgt agg aga ctc act agg ccg aaa gat tat cat acc aaa acc tca agg     1181
Cys Arg Arg Leu Thr Arg Pro Lys Asp Tyr His Thr Lys Thr Ser Arg
    250                 255                 260

aaa gaa cct agt aaa tac cgc tta tgc atc gat atc ttg gaa agg gaa     1229
Lys Glu Pro Ser Lys Tyr Arg Leu Cys Ile Asp Ile Leu Glu Arg Glu
265                 270                 275                 280

att aga agg aat cca ttg gtt agt ggg gat aca ccc act tgt tcc cat     1277
Ile Arg Arg Asn Pro Leu Val Ser Gly Asp Thr Pro Thr Cys Ser His
                285                 290                 295

tcg atg ccc gag gat ctc caa atg agg ttg tta tac tta gaa aag cga     1325
Ser Met Pro Glu Asp Leu Gln Met Arg Leu Leu Tyr Leu Glu Lys Arg
            300                 305                 310

gtg gga ctt gct cag ttg ttc ttc cca gca gaa gcc aat gtg gct atg     1373
Val Gly Leu Ala Gln Leu Phe Phe Pro Ala Glu Ala Asn Val Ala Met
        315                 320                 325

gac gtt gct aat gtt gaa ggg aca agc gag tgc aca ggt ctt cta act     1421
Asp Val Ala Asn Val Glu Gly Thr Ser Glu Cys Thr Gly Leu Leu Thr
    330                 335                 340

cca cct cca tca aat gat aca act gaa aac ttg ggt aaa gtc gat tta     1469
Pro Pro Pro Ser Asn Asp Thr Thr Glu Asn Leu Gly Lys Val Asp Leu
345                 350                 355                 360

aat gaa acg cct tat gtg caa acg aaa aga atg ctt aca cgt atg aaa     1517
Asn Glu Thr Pro Tyr Val Gln Thr Lys Arg Met Leu Thr Arg Met Lys
                365                 370                 375

gcc ctc atg aaa aca gtt gag aca ggt cgg aga tac ttc cca tct tgt     1565
Ala Leu Met Lys Thr Val Glu Thr Gly Arg Arg Tyr Phe Pro Ser Cys
            380                 385                 390

tat gag gtt ctg gat aag tac atg gat cag tat atg gac gaa gaa atc     1613
Tyr Glu Val Leu Asp Lys Tyr Met Asp Gln Tyr Met Asp Glu Glu Ile
        395                 400                 405
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cct gat atg tcg tat ccc gag aaa ggc act gtg aaa gag aga aga cag     1661
Pro Asp Met Ser Tyr Pro Glu Lys Gly Thr Val Lys Glu Arg Arg Gln
    410                 415                 420

aag agg atg aga tat aac gag ctg aag aac gac gtt aaa aaa gca tat     1709
Lys Arg Met Arg Tyr Asn Glu Leu Lys Asn Asp Val Lys Lys Ala Tyr
425                 430                 435                 440

agc aaa gac aaa gtc gcg cgg tct tgt ctt tct tct tca tca cca gct     1757
Ser Lys Asp Lys Val Ala Arg Ser Cys Leu Ser Ser Ser Ser Pro Ala
                445                 450                 455

tct tct ctt aga gaa gcc tta gag aat cca aca tga tcttgtccca          1803
Ser Ser Leu Arg Glu Ala Leu Glu Asn Pro Thr
            460                 465

gataagtaat gctactagag atagttcctt ggaagaaatt agctatttta taggttttgg   1863

tttagaaaac agtggagatc ccattttggt attcaggttt attacatggt ttaggtttga   1923

ttttgtatta aaggagatgg atttttgaaa tgtataaagc aaaacctttc ctttttgctt   1983

tgcttctttc tttaaaaaaa aaattgtaat atatggaagt gaaatcgaag caacgattga   2043

gcaaaaaaaa a                                                        2054
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Met Ala Ala Thr Ala Ile Glu Pro Ser Ser Ser Ile Ser Phe Thr Ser
1               5                   10                  15

Ser His Leu Ser Asn Pro Ser Pro Val Val Thr Thr Tyr His Ser Ala
            20                  25                  30

Ala Asn Leu Glu Glu Leu Ser Ser Asn Leu Glu Gln Leu Leu Thr Asn
        35                  40                  45

Pro Asp Cys Asp Tyr Thr Asp Ala Glu Ile Ile Ile Glu Glu Glu Ala
    50                  55                  60

Asn Pro Arg Lys Leu Arg Asn Tyr Val Glu Lys Ser Leu Val Glu Asn
65                  70                  75                  80

Val Leu Pro Ile Leu Leu Val Ala Phe His Cys Asp Leu Thr Gln Leu
                85                  90                  95

Leu Asp Gln Cys Ile Glu Arg Val Ala Arg Ser Asp Leu Asp Arg Phe
            100                 105                 110
```

Cys Ile Glu Lys Glu Leu Pro Leu Glu Val Leu Glu Lys Ile Lys Gln
115 120 125

Leu Arg Val Lys Ser Val Asn Ile Pro Glu Val Glu Asp Lys Ser Ile
130 135 140

Glu Arg Thr Gly Lys Val Leu Lys Ala Leu Asp Ser Asp Asp Val Glu
145 150 155 160

Leu Val Lys Leu Leu Leu Thr Glu Ser Asp Ile Thr Leu Asp Gln Ala
165 170 175

Asn Gly Leu His Tyr Ala Val Ala Tyr Ser Asp Pro Lys Val Val Thr
180 185 190

Gln Val Leu Asp Leu Asp Met Ala Asp Val Asn Phe Arg Asn Ser Arg
195 200 205

Gly Tyr Thr Val Leu His Ile Ala Ala Met Arg Arg Glu Pro Thr Ile
210 215 220

Ile Ile Pro Leu Ile Gln Lys Gly Ala Asn Ala Ser Asp Phe Thr Phe
225 230 235 240

Asp Gly Arg Ser Ala Val Asn Ile Cys Arg Arg Leu Thr Arg Pro Lys
245 250 255

Asp Tyr His Thr Lys Thr Ser Arg Lys Glu Pro Ser Lys Tyr Arg Leu
260 265 270

Cys Ile Asp Ile Leu Glu Arg Glu Ile Arg Arg Asn Pro Leu Val Ser
275 280 285

Gly Asp Thr Pro Thr Cys Ser His Ser Met Pro Glu Asp Leu Gln Met
290 295 300

Arg Leu Leu Tyr Leu Glu Lys Arg Val Gly Leu Ala Gln Leu Phe Phe
305 310 315 320

Pro Ala Glu Ala Asn Val Ala Met Asp Val Ala Asn Val Glu Gly Thr
325 330 335

Ser Glu Cys Thr Gly Leu Leu Thr Pro Pro Pro Ser Asn Asp Thr Thr

340 345 350

Glu Asn Leu Gly Lys Val Asp Leu Asn Glu Thr Pro Tyr Val Gln Thr
355 360 365

Lys Arg Met Leu Thr Arg Met Lys Ala Leu Met Lys Thr Val Glu Thr
370 375 380

Gly Arg Arg Tyr Phe Pro Ser Cys Tyr Glu Val Leu Asp Lys Tyr Met
385 390 395 400

Asp Gln Tyr Met Asp Glu Glu Ile Pro Asp Met Ser Tyr Pro Glu Lys
405 410 415

Gly Thr Val Lys Glu Arg Arg Gln Lys Arg Met Arg Tyr Asn Glu Leu
420 425 430

Lys Asn Asp Val Lys Lys Ala Tyr Ser Lys Asp Lys Val Ala Arg Ser
435 440 445

Cys Leu Ser Ser Ser Ser Pro Ala Ser Ser Leu Arg Glu Ala Leu Glu
450 455 460

Asn Pro Thr
465

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Met
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caa gag ttc cat agt agc aaa gat tca ttg cct tgt cct gca act tct 107
Gln Glu Phe His Ser Ser Lys Asp Ser Leu Pro Cys Pro Ala Thr Ser
5 10 15

tgg gat aac tct gtc ttc acc aac tca aat gtc caa gga tca tca tcc 155
Trp Asp Asn Ser Val Phe Thr Asn Ser Asn Val Gln Gly Ser Ser Ser
20 25 30

ttg acc gat aac aac act tta agc ttg aca atg gag atg aaa caa act 203
Leu Thr Asp Asn Asn Thr Leu Ser Leu Thr Met Glu Met Lys Gln Thr
35 40 45

ggt ttt caa atg cag cac tat gat tcc tcc tct act caa tcc act gga 251
Gly Phe Gln Met Gln His Tyr Asp Ser Ser Ser Thr Gln Ser Thr Gly

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50                  55                  60                  65

gga gaa tca tat agt gaa gtt gct agc tta agt gaa cct act aat cgt      299
Gly Glu Ser Tyr Ser Glu Val Ala Ser Leu Ser Glu Pro Thr Asn Arg
                70                  75                  80

tat ggc cac aac att gtt gtc act cat ctc tca ggt tac aaa gaa aac      347
Tyr Gly His Asn Ile Val Val Thr His Leu Ser Gly Tyr Lys Glu Asn
            85                  90                  95

ccg gaa aat cct att gga agt cat tcg ata tca aag gtg tct caa gat      395
Pro Glu Asn Pro Ile Gly Ser His Ser Ile Ser Lys Val Ser Gln Asp
        100                 105                 110

tca gtg gtt ctt cct att gag gcg gct tct tgg cct tta cac ggc aat      443
Ser Val Val Leu Pro Ile Glu Ala Ala Ser Trp Pro Leu His Gly Asn
    115                 120                 125

gta acg cca cat ttc aat ggt ttc ttg tct ttt cct tat gca tca caa      491
Val Thr Pro His Phe Asn Gly Phe Leu Ser Phe Pro Tyr Ala Ser Gln
130                 135                 140                 145

cac acg gtg cag cat cct caa atc aga ggg ttg gtt ccg tct aga atg      539
His Thr Val Gln His Pro Gln Ile Arg Gly Leu Val Pro Ser Arg Met
                150                 155                 160

cct ttg cct cac aac att cca gag aac gaa cca att ttc gtc aat gca      587
Pro Leu Pro His Asn Ile Pro Glu Asn Glu Pro Ile Phe Val Asn Ala
            165                 170                 175

aaa cag tac caa gcc att ctc cgc cgc aga gag cgc cgt gca aag ctt      635
Lys Gln Tyr Gln Ala Ile Leu Arg Arg Arg Glu Arg Arg Ala Lys Leu
        180                 185                 190

gaa gct cag aac aag ctc atc aaa gtc cgc aaa cca tat ctt cac gag      683
Glu Ala Gln Asn Lys Leu Ile Lys Val Arg Lys Pro Tyr Leu His Glu
    195                 200                 205

tcg cgg cac ctc cat gca cta aag aga gtt aga ggc tct ggt gga cgt      731
Ser Arg His Leu His Ala Leu Lys Arg Val Arg Gly Ser Gly Gly Arg
210                 215                 220                 225

ttc ctc aac aca aag aag cat caa gaa tca aat tcc tca cta tct cct      779
Phe Leu Asn Thr Lys Lys His Gln Glu Ser Asn Ser Ser Leu Ser Pro
                230                 235                 240

cca ttc ttg att cca cct cat gtc ttc aag aac tct cca gga aag ttc      827
Pro Phe Leu Ile Pro Pro His Val Phe Lys Asn Ser Pro Gly Lys Phe
            245                 250                 255

cgg caa atg gac att tca agg ggt ggg gtt gtg tct agt gtc tcg aca      875
Arg Gln Met Asp Ile Ser Arg Gly Gly Val Val Ser Ser Val Ser Thr
        260                 265                 270

aca tct tgc tcg gac ata acc ggg aac aac aac gac atg ttc cag caa      923
Thr Ser Cys Ser Asp Ile Thr Gly Asn Asn Asn Asp Met Phe Gln Gln
    275                 280                 285
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```
aac cca caa ttc agg ttc tca ggt tat cca tca aac cac cat gtc tca      971
Asn Pro Gln Phe Arg Phe Ser Gly Tyr Pro Ser Asn His His Val Ser
290                 295                 300                 305

gtc ctc atg tga gagagctccc gcaagtggtg gatgaggc                     1011
Val Leu Met
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Met Gln Glu Phe His Ser Ser Lys Asp Ser Leu Pro Cys Pro Ala Thr
1               5                   10                  15

Ser Trp Asp Asn Ser Val Phe Thr Asn Ser Asn Val Gln Gly Ser Ser
            20                  25                  30

Ser Leu Thr Asp Asn Asn Thr Leu Ser Leu Thr Met Glu Met Lys Gln
        35                  40                  45

Thr Gly Phe Gln Met Gln His Tyr Asp Ser Ser Ser Thr Gln Ser Thr
    50                  55                  60

Gly Gly Glu Ser Tyr Ser Glu Val Ala Ser Leu Ser Glu Pro Thr Asn
65                  70                  75                  80

Arg Tyr Gly His Asn Ile Val Val Thr His Leu Ser Gly Tyr Lys Glu
                85                  90                  95

Asn Pro Glu Asn Pro Ile Gly Ser His Ser Ile Ser Lys Val Ser Gln
            100                 105                 110

Asp Ser Val Val Leu Pro Ile Glu Ala Ala Ser Trp Pro Leu His Gly
        115                 120                 125

Asn Val Thr Pro His Phe Asn Gly Phe Leu Ser Phe Pro Tyr Ala Ser
    130                 135                 140

Gln His Thr Val Gln His Pro Gln Ile Arg Gly Leu Val Pro Ser Arg
145                 150                 155                 160

Met Pro Leu Pro His Asn Ile Pro Glu Asn Glu Pro Ile Phe Val Asn
                165                 170                 175

Ala Lys Gln Tyr Gln Ala Ile Leu Arg Arg Arg Glu Arg Arg Ala Lys
```

```
            180                 185                 190

Leu Glu Ala Gln Asn Lys Leu Ile Lys Val Arg Lys Pro Tyr Leu His
        195                 200                 205

Glu Ser Arg His Leu His Ala Leu Lys Arg Val Arg Gly Ser Gly Gly
    210                 215                 220

Arg Phe Leu Asn Thr Lys Lys His Gln Glu Ser Asn Ser Ser Leu Ser
225                 230                 235                 240

Pro Pro Phe Leu Ile Pro Pro His Val Phe Lys Asn Ser Pro Gly Lys
                245                 250                 255

Phe Arg Gln Met Asp Ile Ser Arg Gly Gly Val Val Ser Ser Val Ser
            260                 265                 270

Thr Thr Ser Cys Ser Asp Ile Thr Gly Asn Asn Asn Asp Met Phe Gln
        275                 280                 285

Gln Asn Pro Gln Phe Arg Phe Ser Gly Tyr Pro Ser Asn His His Val
    290                 295                 300

Ser Val Leu Met
305
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Application Publication

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                                                    Met Gly Arg
                                                    1

ggg aag att gtg atc caa agg atc gat gat tca acg agt aga caa gtc      106
Gly Lys Ile Val Ile Gln Arg Ile Asp Asp Ser Thr Ser Arg Gln Val
    5                   10                  15

act ttc tcc aaa cga aga aag ggc ctt atc aag aaa gcc aaa gag cta      154
Thr Phe Ser Lys Arg Arg Lys Gly Leu Ile Lys Lys Ala Lys Glu Leu
20                  25                  30                  35

gct att ctc tgt gat gcc gag gtc ggt ctc atc atc ttc tct agc acc      202
Ala Ile Leu Cys Asp Ala Glu Val Gly Leu Ile Ile Phe Ser Ser Thr
                40                  45                  50

gga aag ctc tat gac ttt gca agc tcc agc atg aag tcg gtt att gat      250
Gly Lys Leu Tyr Asp Phe Ala Ser Ser Ser Met Lys Ser Val Ile Asp
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```
            55                  60                  65

aga tac aac aag agc aag atc gag caa caa caa cta ttg aac ccc gca      298
Arg Tyr Asn Lys Ser Lys Ile Glu Gln Gln Gln Leu Leu Asn Pro Ala
        70                  75                  80

tca gaa gtc aag ttt tgg cag aga gaa gct gct gtt cta aga caa gaa      346
Ser Glu Val Lys Phe Trp Gln Arg Glu Ala Ala Val Leu Arg Gln Glu
    85                  90                  95

ctg cat gct ttg caa gaa aat cat cgg caa atg atg gga gaa cag cta      394
Leu His Ala Leu Gln Glu Asn His Arg Gln Met Met Gly Glu Gln Leu
100                 105                 110                 115

aat ggt tta agt gtt aac gag cta aac agt ctt gag aat caa att gag      442
Asn Gly Leu Ser Val Asn Glu Leu Asn Ser Leu Glu Asn Gln Ile Glu
                120                 125                 130

ata agt ttg cgt gga att cgt atg aga aag gaa caa ctg ttg act caa      490
Ile Ser Leu Arg Gly Ile Arg Met Arg Lys Glu Gln Leu Leu Thr Gln
            135                 140                 145

gaa atc caa gaa cta agc caa aag agg aat ctt att cat cag gaa aac      538
Glu Ile Gln Glu Leu Ser Gln Lys Arg Asn Leu Ile His Gln Glu Asn
        150                 155                 160

ctc gat tta tct agg aaa gta caa cgg att cat caa gaa aat gtg gag      586
Leu Asp Leu Ser Arg Lys Val Gln Arg Ile His Gln Glu Asn Val Glu
    165                 170                 175

ctc tac aag aag gct tat atg gca aac aca aac ggg ttt aca cac cgt      634
Leu Tyr Lys Lys Ala Tyr Met Ala Asn Thr Asn Gly Phe Thr His Arg
180                 185                 190                 195

gaa gta gct gtt gcg gat gat gaa tca cac act cag att cgg ctg caa      682
Glu Val Ala Val Ala Asp Asp Glu Ser His Thr Gln Ile Arg Leu Gln
                200                 205                 210

cta agc cag cct gaa cat tcc gat tat gac act cca cca aga gca aac      730
Leu Ser Gln Pro Glu His Ser Asp Tyr Asp Thr Pro Pro Arg Ala Asn
            215                 220                 225

gaa taa cagagagatt gaagttggaa gataccatga tgttgaagaa cactccaaag      786
Glu

gccttggttt gaataaggtt cttgaactgg aaacctctat acaccaagcc acgtacgata    846

agcagcatgg ttcttctaac atagtcatat tttcaatcct aaatataatt aaagcatata    906

taattaaaat ccggtgttgt tatactcatc ttgagtatta atattgtact tgtttataac    966

catagattcg tcaattaata gagaaaaatc atatgaatta ttatccaaaa aaaaaaaaaa   1026

aaaaaaaaaa aa                                                       1038
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<210> 32 <211> 228 <212> PRT <213> Arabidopsis thaliana <400> 32

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Met Gly Arg Gly Lys Ile Val Ile Gln Arg Ile Asp Asp Ser Thr Ser
1               5                   10                  15

Arg Gln Val Thr Phe Ser Lys Arg Arg Lys Gly Leu Ile Lys Lys Ala
            20                  25                  30

Lys Glu Leu Ala Ile Leu Cys Asp Ala Glu Val Gly Leu Ile Ile Phe
        35                  40                  45

Ser Ser Thr Gly Lys Leu Tyr Asp Phe Ala Ser Ser Ser Met Lys Ser
    50                  55                  60

Val Ile Asp Arg Tyr Asn Lys Ser Lys Ile Glu Gln Gln Gln Leu Leu
65                  70                  75                  80

Asn Pro Ala Ser Glu Val Lys Phe Trp Gln Arg Glu Ala Ala Val Leu
                85                  90                  95

Arg Gln Glu Leu His Ala Leu Gln Glu Asn His Arg Gln Met Met Gly
            100                 105                 110

Glu Gln Leu Asn Gly Leu Ser Val Asn Glu Leu Asn Ser Leu Glu Asn
        115                 120                 125

Gln Ile Glu Ile Ser Leu Arg Gly Ile Arg Met Arg Lys Glu Gln Leu
    130                 135                 140

Leu Thr Gln Glu Ile Gln Glu Leu Ser Gln Lys Arg Asn Leu Ile His
145                 150                 155                 160

Gln Glu Asn Leu Asp Leu Ser Arg Lys Val Gln Arg Ile His Gln Glu
                165                 170                 175

Asn Val Glu Leu Tyr Lys Lys Ala Tyr Met Ala Asn Thr Asn Gly Phe
            180                 185                 190

Thr His Arg Glu Val Ala Val Ala Asp Asp Glu Ser His Thr Gln Ile
        195                 200                 205

Arg Leu Gln Leu Ser Gln Pro Glu His Ser Asp Tyr Asp Thr Pro Pro
    210                 215                 220
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Arg Ala Asn Glu
225

<210> 33 <211> 609 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(609) <223> G1820

<400> 33

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atg gct gag aac aac aac aac aac ggc gac aac atg aac aac gac aac       48
Met Ala Glu Asn Asn Asn Asn Asn Gly Asp Asn Met Asn Asn Asp Asn
1               5                   10                  15

cac cag caa cca ccg tcg tac tcg cag ctg ccg ccg atg gca tca tcc       96
His Gln Gln Pro Pro Ser Tyr Ser Gln Leu Pro Pro Met Ala Ser Ser
            20                  25                  30

aac cct cag tta cgt aat tac tgg att gag cag atg gaa acc gtc tcg      144
Asn Pro Gln Leu Arg Asn Tyr Trp Ile Glu Gln Met Glu Thr Val Ser
        35                  40                  45

gat ttc aaa aac cgt cag ctt cca ttg gct cga att aag aag atc atg      192
Asp Phe Lys Asn Arg Gln Leu Pro Leu Ala Arg Ile Lys Lys Ile Met
    50                  55                  60

aag gct gat cca gat gtg cac atg gtc tcc gca gag gct ccg atc atc      240
Lys Ala Asp Pro Asp Val His Met Val Ser Ala Glu Ala Pro Ile Ile
65                  70                  75                  80

ttc gca aag gct tgc gaa atg ttc atc gtt gat ctc acg atg cgg tcg      288
Phe Ala Lys Ala Cys Glu Met Phe Ile Val Asp Leu Thr Met Arg Ser
                85                  90                  95

tgg ctc aaa gcc gag gag aac aaa cgc cac acg ctt cag aaa tcg gat      336
Trp Leu Lys Ala Glu Glu Asn Lys Arg His Thr Leu Gln Lys Ser Asp
            100                 105                 110

atc tcc aac gca gtg gct agc tct ttc acc tac gat ttc ctt ctt gat      384
Ile Ser Asn Ala Val Ala Ser Ser Phe Thr Tyr Asp Phe Leu Leu Asp
        115                 120                 125

gtt gtc cct aag gac gag tct atc gcc acc gct gat cct ggc ttt gtg      432
Val Val Pro Lys Asp Glu Ser Ile Ala Thr Ala Asp Pro Gly Phe Val
    130                 135                 140

gct atg cca cat cct gac ggt gga gga gta ccg caa tat tat tat cca      480
Ala Met Pro His Pro Asp Gly Gly Gly Val Pro Gln Tyr Tyr Tyr Pro
145                 150                 155                 160

ccg gga gtg gtg atg gga act cct atg gtt ggt agt gga atg tac gcg      528
Pro Gly Val Val Met Gly Thr Pro Met Val Gly Ser Gly Met Tyr Ala
                165                 170                 175

cca tcg cag gcg tgg cca gca gcg gct ggt gac ggg gag gat gat gct      576
Pro Ser Gln Ala Trp Pro Ala Ala Ala Gly Asp Gly Glu Asp Asp Ala
            180                 185                 190
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gag gat aat gga gga aac ggc ggc gga aat tga 609
Glu Asp Asn Gly Gly Asn Gly Gly Gly Asn
195 200

<210> 34 <211> 202 <212> PRT <213> Arabidopsis thaliana <400> 34

Met Ala Glu Asn Asn Asn Asn Asn Gly Asp Asn Met Asn Asn Asp Asn
1 5 10 15

His Gln Gln Pro Pro Ser Tyr Ser Gln Leu Pro Pro Met Ala Ser Ser
20 25 30

Asn Pro Gln Leu Arg Asn Tyr Trp Ile Glu Gln Met Glu Thr Val Ser
35 40 45

Asp Phe Lys Asn Arg Gln Leu Pro Leu Ala Arg Ile Lys Lys Ile Met
50 55 60

Lys Ala Asp Pro Asp Val His Met Val Ser Ala Glu Ala Pro Ile Ile
65 70 75 80

Phe Ala Lys Ala Cys Glu Met Phe Ile Val Asp Leu Thr Met Arg Ser
85 90 95

Trp Leu Lys Ala Glu Glu Asn Lys Arg His Thr Leu Gln Lys Ser Asp
100 105 110

Ile Ser Asn Ala Val Ala Ser Ser Phe Thr Tyr Asp Phe Leu Leu Asp
115 120 125

Val Val Pro Lys Asp Glu Ser Ile Ala Thr Ala Asp Pro Gly Phe Val
130 135 140

Ala Met Pro His Pro Asp Gly Gly Gly Val Pro Gln Tyr Tyr Tyr Pro
145 150 155 160

Pro Gly Val Val Met Gly Thr Pro Met Val Gly Ser Gly Met Tyr Ala
165 170 175

Pro Ser Gln Ala Trp Pro Ala Ala Ala Gly Asp Gly Glu Asp Asp Ala
180 185 190

Glu Asp Asn Gly Gly Asn Gly Gly Gly Asn
195 200

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<222> (76)..(1077) <223> G1930

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atttcgtttc ataac atg gat gcc atg agt agc gta gac gag agc tct aca 111
Met Asp Ala Met Ser Ser Val Asp Glu Ser Ser Thr
1 5 10

act aca gat tcc att ccg gcg aga aag tca tcg tct ccg gcg agt tta 159
Thr Thr Asp Ser Ile Pro Ala Arg Lys Ser Ser Ser Pro Ala Ser Leu
15 20 25

cta tat aga atg gga agc gga aca agc gtg gta ctt gat tca gag aac 207
Leu Tyr Arg Met Gly Ser Gly Thr Ser Val Val Leu Asp Ser Glu Asn
30 35 40

ggt gtc gaa gtc gaa gtc gaa gcc gaa tca aga aag ctt cct tct tca 255
Gly Val Glu Val Glu Val Glu Ala Glu Ser Arg Lys Leu Pro Ser Ser
45 50 55 60

aga ttc aaa ggt gtt gtt cct caa cca aat gga aga tgg gga gct cag 303
Arg Phe Lys Gly Val Val Pro Gln Pro Asn Gly Arg Trp Gly Ala Gln
65 70 75

att tac gag aaa cat caa cgc gtg tgg ctt ggt act ttc aac gag gaa 351
Ile Tyr Glu Lys His Gln Arg Val Trp Leu Gly Thr Phe Asn Glu Glu
80 85 90

gac gaa gca gct cgt gct tac gac gtc gcg gct cac cgt ttc cgt ggc 399
Asp Glu Ala Ala Arg Ala Tyr Asp Val Ala Ala His Arg Phe Arg Gly
95 100 105

cgc gat gcc gtt act aat ttc aaa gac acg acg ttc gaa gaa gag gtt 447
Arg Asp Ala Val Thr Asn Phe Lys Asp Thr Thr Phe Glu Glu Glu Val
110 115 120

gag ttc tta aac gcg cat tcg aaa tca gag atc gta gat atg ttg aga 495
Glu Phe Leu Asn Ala His Ser Lys Ser Glu Ile Val Asp Met Leu Arg
125 130 135 140

aaa cac act tac aaa gaa gag tta gac caa agg aaa cgt aac cgt gac 543
Lys His Thr Tyr Lys Glu Glu Leu Asp Gln Arg Lys Arg Asn Arg Asp
145 150 155

ggt aac gga aaa gag acg acg gcg ttt gct ttg gct tcg atg gtg gtt 591
Gly Asn Gly Lys Glu Thr Thr Ala Phe Ala Leu Ala Ser Met Val Val
160 165 170

atg acg ggg ttt aaa acg gcg gag tta ctg ttt gag aaa acg gta acg 639
Met Thr Gly Phe Lys Thr Ala Glu Leu Leu Phe Glu Lys Thr Val Thr
175 180 185

cca agt gac gtc ggg aaa cta aac cgt tta gtt ata cca aaa cac caa 687

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Pro Ser Asp Val Gly Lys Leu Asn Arg Leu Val Ile Pro Lys His Gln
    190                 195                 200

gcg gag aaa cat ttt ccg tta ccg tta ggt aat aat aac gtc tcc gtt      735
Ala Glu Lys His Phe Pro Leu Pro Leu Gly Asn Asn Asn Val Ser Val
205                 210                 215                 220

aaa ggt atg ctg ttg aat ttc gaa gac gtt aac ggg aaa gtg tgg agg      783
Lys Gly Met Leu Leu Asn Phe Glu Asp Val Asn Gly Lys Val Trp Arg
                225                 230                 235

ttc cgt tac tct tat tgg aat agt agt caa agt tat gtg ttg acc aaa      831
Phe Arg Tyr Ser Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys
            240                 245                 250

ggt tgg agt aga ttc gtt aaa gag aag aga ctt tgt gct ggt gat ttg      879
Gly Trp Ser Arg Phe Val Lys Glu Lys Arg Leu Cys Ala Gly Asp Leu
        255                 260                 265

atc agt ttt aaa aga tcc aac gat caa gat caa aaa ttc ttt atc ggg      927
Ile Ser Phe Lys Arg Ser Asn Asp Gln Asp Gln Lys Phe Phe Ile Gly
    270                 275                 280

tgg aaa tcg aaa tcc ggg ttg gat cta gag acg ggt cgg gtt atg aga      975
Trp Lys Ser Lys Ser Gly Leu Asp Leu Glu Thr Gly Arg Val Met Arg
285                 290                 295                 300

ttg ttt ggg gtt gat att tct tta aac gcc gtc gtt gta gtg aag gaa     1023
Leu Phe Gly Val Asp Ile Ser Leu Asn Ala Val Val Val Val Lys Glu
                305                 310                 315

aca acg gag gtg tta atg tcg tcg tta agg tgt aag aag caa cga gtt     1071
Thr Thr Glu Val Leu Met Ser Ser Leu Arg Cys Lys Lys Gln Arg Val
            320                 325                 330

ttg taa taacaattta acaacttggg aaagaaaaaa aagctttttg attttaattt     1127
Leu

ctcttcaacg ttaatcttgc tgagatta                                     1155

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Met Asp Ala Met Ser Ser Val Asp Glu Ser Ser Thr Thr Thr Asp Ser
1               5                   10                  15

Ile Pro Ala Arg Lys Ser Ser Ser Pro Ala Ser Leu Leu Tyr Arg Met
            20                  25                  30

Gly Ser Gly Thr Ser Val Val Leu Asp Ser Glu Asn Gly Val Glu Val
        35                  40                  45

Glu Val Glu Ala Glu Ser Arg Lys Leu Pro Ser Ser Arg Phe Lys Gly
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50 55 60

Val Val Pro Gln Pro Asn Gly Arg Trp Gly Ala Gln Ile Tyr Glu Lys
65 70 75 80

His Gln Arg Val Trp Leu Gly Thr Phe Asn Glu Glu Asp Glu Ala Ala
85 90 95

Arg Ala Tyr Asp Val Ala Ala His Arg Phe Arg Gly Arg Asp Ala Val
100 105 110

Thr Asn Phe Lys Asp Thr Thr Phe Glu Glu Glu Val Glu Phe Leu Asn
115 120 125

Ala His Ser Lys Ser Glu Ile Val Asp Met Leu Arg Lys His Thr Tyr
130 135 140

Lys Glu Glu Leu Asp Gln Arg Lys Arg Asn Arg Asp Gly Asn Gly Lys
145 150 155 160

Glu Thr Thr Ala Phe Ala Leu Ala Ser Met Val Val Met Thr Gly Phe
165 170 175

Lys Thr Ala Glu Leu Leu Phe Glu Lys Thr Val Thr Pro Ser Asp Val
180 185 190

Gly Lys Leu Asn Arg Leu Val Ile Pro Lys His Gln Ala Glu Lys His
195 200 205

Phe Pro Leu Pro Leu Gly Asn Asn Asn Val Ser Val Lys Gly Met Leu
210 215 220

Leu Asn Phe Glu Asp Val Asn Gly Lys Val Trp Arg Phe Arg Tyr Ser
225 230 235 240

Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys Gly Trp Ser Arg
245 250 255

Phe Val Lys Glu Lys Arg Leu Cys Ala Gly Asp Leu Ile Ser Phe Lys
260 265 270

Arg Ser Asn Asp Gln Asp Gln Lys Phe Phe Ile Gly Trp Lys Ser Lys
275 280 285

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Ser Gly Leu Asp Leu Glu Thr Gly Arg Val Met Arg Leu Phe Gly Val
    290                 295                 300

Asp Ile Ser Leu Asn Ala Val Val Val Val Lys Glu Thr Thr Glu Val
305                 310                 315                 320

Leu Met Ser Ser Leu Arg Cys Lys Lys Gln Arg Val Leu
                325                 330
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Met Glu Gly Lys Arg Ser Gln Gly Gln Gly Tyr Met Lys Lys Lys Ser
1               5                   10                  15

tac ctt gtg gaa gaa gat atg gag act gat acg gat gaa gaa gag gaa       96
Tyr Leu Val Glu Glu Asp Met Glu Thr Asp Thr Asp Glu Glu Glu Glu
            20                  25                  30

gta ggt agg gat aga gtt aga ggg tct aga ggt agc atc aat cgt ggt      144
Val Gly Arg Asp Arg Val Arg Gly Ser Arg Gly Ser Ile Asn Arg Gly
        35                  40                  45

ggc tcg ttg cgg ctt tgc caa gta gat aga tgc aca gct gat atg aaa      192
Gly Ser Leu Arg Leu Cys Gln Val Asp Arg Cys Thr Ala Asp Met Lys
    50                  55                  60

gag gca aaa ctg tat cac cgg aga cac aaa gtg tgt gaa gtt cat gca      240
Glu Ala Lys Leu Tyr His Arg Arg His Lys Val Cys Glu Val His Ala
65                  70                  75                  80

aag gca tct tct gtc ttt ctc tca gga ctt aac caa cgc ttt tgt caa      288
Lys Ala Ser Ser Val Phe Leu Ser Gly Leu Asn Gln Arg Phe Cys Gln
                85                  90                  95

caa tgc agt agg ttt cat gac ctc caa gag ttt gat gaa gct aag aga      336
Gln Cys Ser Arg Phe His Asp Leu Gln Glu Phe Asp Glu Ala Lys Arg
            100                 105                 110

agt tgc agg agg cgc tta gct gga cac aat gag cga aga agg aag agc      384
Ser Cys Arg Arg Arg Leu Ala Gly His Asn Glu Arg Arg Arg Lys Ser
        115                 120                 125

tct ggt gag agt act tat gga gaa gga tca ggt cgg aga gga atc aat      432
Ser Gly Glu Ser Thr Tyr Gly Glu Gly Ser Gly Arg Arg Gly Ile Asn
    130                 135                 140

ggt cag gtg gtg atg cag aat caa gaa aga tca agg gta gag atg aca      480
Gly Gln Val Val Met Gln Asn Gln Glu Arg Ser Arg Val Glu Met Thr
145                 150                 155                 160
```

ctt cct atg cca aac tca tca ttc aag cga cca cag att aga tag 525
Leu Pro Met Pro Asn Ser Ser Phe Lys Arg Pro Gln Ile Arg
165 170

<210> 38 <211> 174 <212> PRT <213> Arabidopsis thaliana <400> 38

Met Glu Gly Lys Arg Ser Gln Gly Gln Gly Tyr Met Lys Lys Lys Ser
1 5 10 15

Tyr Leu Val Glu Glu Asp Met Glu Thr Asp Thr Asp Glu Glu Glu Glu
20 25 30

Val Gly Arg Asp Arg Val Arg Gly Ser Arg Gly Ser Ile Asn Arg Gly
35 40 45

Gly Ser Leu Arg Leu Cys Gln Val Asp Arg Cys Thr Ala Asp Met Lys
50 55 60

Glu Ala Lys Leu Tyr His Arg Arg His Lys Val Cys Glu Val His Ala
65 70 75 80

Lys Ala Ser Ser Val Phe Leu Ser Gly Leu Asn Gln Arg Phe Cys Gln
85 90 95

Gln Cys Ser Arg Phe His Asp Leu Gln Glu Phe Asp Glu Ala Lys Arg
100 105 110

Ser Cys Arg Arg Arg Leu Ala Gly His Asn Glu Arg Arg Arg Lys Ser
115 120 125

Ser Gly Glu Ser Thr Tyr Gly Glu Gly Ser Gly Arg Arg Gly Ile Asn
130 135 140

Gly Gln Val Val Met Gln Asn Gln Glu Arg Ser Arg Val Glu Met Thr
145 150 155 160

Leu Pro Met Pro Asn Ser Ser Phe Lys Arg Pro Gln Ile Arg
165 170

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<222> (16)..(477) <223> G3

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                  Met Glu Arg Glu Gln Glu Glu Ser Thr Met Arg Lys
                  1               5                   10

aga agg cag cca cct caa gaa gaa gtg cct aac cac gtg gct aca agg       99
Arg Arg Gln Pro Pro Gln Glu Glu Val Pro Asn His Val Ala Thr Arg
        15                  20                  25

aag ccg tac aga ggg ata cgg agg agg aag tgg ggc aag tgg gtg gct      147
Lys Pro Tyr Arg Gly Ile Arg Arg Arg Lys Trp Gly Lys Trp Val Ala
    30                  35                  40

gag att cgt gag cct aac aaa cgc tca cgg ctt tgg ctt ggc tct tac      195
Glu Ile Arg Glu Pro Asn Lys Arg Ser Arg Leu Trp Leu Gly Ser Tyr
45                  50                  55                  60

aca acc gat atc gcc gcc gct aga gcc tac gac gtg gcc gtc ttc tac      243
Thr Thr Asp Ile Ala Ala Ala Arg Ala Tyr Asp Val Ala Val Phe Tyr
                65                  70                  75

ctc cgt ggc ccc tcc gca cgt ctc aac ttc cct gat ctt ctc ttg caa      291
Leu Arg Gly Pro Ser Ala Arg Leu Asn Phe Pro Asp Leu Leu Leu Gln
            80                  85                  90

gaa gag gac cat ctc tca gcc gcc acc acc gct gac atg ccc gca gct      339
Glu Glu Asp His Leu Ser Ala Ala Thr Thr Ala Asp Met Pro Ala Ala
        95                  100                 105

ctt ata agg gaa aaa gcg gcg gag gtc ggc gcc aga gtc gac gct ctt      387
Leu Ile Arg Glu Lys Ala Ala Glu Val Gly Ala Arg Val Asp Ala Leu
    110                 115                 120

cta gct tct gcc gct cct tcg atg gct cac tcc act ccg ccg gta ata      435
Leu Ala Ser Ala Ala Pro Ser Met Ala His Ser Thr Pro Pro Val Ile
125                 130                 135                 140

aaa ccc gac ttg aat caa ata ccc gaa tcc gga gat ata tag               477
Lys Pro Asp Leu Asn Gln Ile Pro Glu Ser Gly Asp Ile
                145                 150

tcaatttata tacatgtagt ttgttttgtt tgattagaag attacattta catacaagat    537

acacatagat actggaaaat ataggtatgt atacattcat aaattatctt atgtatcaaa    597

gaattttata gattctgatt agctttttgt ttttgttttt gataagaact ctgattagtt    657

gtccggagac aaaaccggct aagagcaatc catgagaagc tagcgagtgt tttttagttc    717

aagttgtaat ataaatgcat attaattctt tagtaatttt gt                       759


<210>  40 <211>  153 <212>  PRT <213>  Arabidopsis thaliana  <400>  40

Met Glu Arg Glu Gln Glu Glu Ser Thr Met Arg Lys Arg Arg Gln Pro
1               5                   10                  15

Pro Gln Glu Glu Val Pro Asn His Val Ala Thr Arg Lys Pro Tyr Arg
```

```
            20                  25                  30

Gly Ile Arg Arg Arg Lys Trp Gly Lys Trp Val Ala Glu Ile Arg Glu
        35                  40                  45

Pro Asn Lys Arg Ser Arg Leu Trp Leu Gly Ser Tyr Thr Thr Asp Ile
    50                  55                  60

Ala Ala Ala Arg Ala Tyr Asp Val Ala Val Phe Tyr Leu Arg Gly Pro
65                  70                  75                  80

Ser Ala Arg Leu Asn Phe Pro Asp Leu Leu Leu Gln Glu Glu Asp His
                85                  90                  95

Leu Ser Ala Ala Thr Thr Ala Asp Met Pro Ala Ala Leu Ile Arg Glu
            100                 105                 110

Lys Ala Ala Glu Val Gly Ala Arg Val Asp Ala Leu Leu Ala Ser Ala
        115                 120                 125

Ala Pro Ser Met Ala His Ser Thr Pro Pro Val Ile Lys Pro Asp Leu
    130                 135                 140

Asn Gln Ile Pro Glu Ser Gly Asp Ile
145                 150
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<400> 41

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gccatagtgc gtctagggtt tggttggtgg gaagaaggtt ccgatc atg gcg tcg       115
                                                    Met Ala Ser
                                                    1

gtg tcg tcg tcg gat caa gga cct aag aca gaa gca gga tgt agc ggc       163
Val Ser Ser Ser Asp Gln Gly Pro Lys Thr Glu Ala Gly Cys Ser Gly
    5                   10                  15

gga gga gga gga gag agc tcg gag aca gtg gcg gcg agt gat cag atg       211
Gly Gly Gly Gly Glu Ser Ser Glu Thr Val Ala Ala Ser Asp Gln Met
20                  25                  30                  35

ttg ttg tat aga ggt ttt aag aag gcg aag aag gag aga ggt tgt aca       259
Leu Leu Tyr Arg Gly Phe Lys Lys Ala Lys Lys Glu Arg Gly Cys Thr
                40                  45                  50
```

```
gct aag gag cgt att agt aaa atg cct ccg tgc act gct ggg aaa agg      307
Ala Lys Glu Arg Ile Ser Lys Met Pro Pro Cys Thr Ala Gly Lys Arg
            55                  60                  65

agt tcc ata tac cgg gga gtc acc aga cat aga tgg aca ggt cgt tat      355
Ser Ser Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr
        70                  75                  80

gaa gct cac ctt tgg gat aag agt acc tgg aac caa aac cag aac aag      403
Glu Ala His Leu Trp Asp Lys Ser Thr Trp Asn Gln Asn Gln Asn Lys
    85                  90                  95

aag gga aaa caa gtt tat cta gga gca tat gat gat gaa gag gct gct      451
Lys Gly Lys Gln Val Tyr Leu Gly Ala Tyr Asp Asp Glu Glu Ala Ala
100                 105                 110                 115

gct aga gct tac gac ctt gct gcc tta aaa tat tgg ggt cct ggg aca      499
Ala Arg Ala Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Pro Gly Thr
                120                 125                 130

ctt ata aat ttt ccg gtg act gat tat acc agg gat tta gaa gaa atg      547
Leu Ile Asn Phe Pro Val Thr Asp Tyr Thr Arg Asp Leu Glu Glu Met
            135                 140                 145

caa aat ctc tca agg gaa gaa tac ctt gca tct tta cgt aga tat ccc      595
Gln Asn Leu Ser Arg Glu Glu Tyr Leu Ala Ser Leu Arg Arg Tyr Pro
        150                 155                 160

ttt ggc aga aaa agc agc ggt ttc tct agg gga ata gcg aaa tat cgt      643
Phe Gly Arg Lys Ser Ser Gly Phe Ser Arg Gly Ile Ala Lys Tyr Arg
    165                 170                 175

gga ctt caa agc cga tgg gac gca tca gcc agt cgt atg cct gga cct      691
Gly Leu Gln Ser Arg Trp Asp Ala Ser Ala Ser Arg Met Pro Gly Pro
180                 185                 190                 195

gaa tac ttc agt aac att cat tac ggg gca ggt gat gat cgt gga aca      739
Glu Tyr Phe Ser Asn Ile His Tyr Gly Ala Gly Asp Asp Arg Gly Thr
                200                 205                 210

gaa ggt gac ttt cta ggt agc ttt tgt ctg gaa aga aag att gat cta      787
Glu Gly Asp Phe Leu Gly Ser Phe Cys Leu Glu Arg Lys Ile Asp Leu
            215                 220                 225

aca gga tac ata aag tgg tgg gga gcc aac aag aac cgt caa cca gaa      835
Thr Gly Tyr Ile Lys Trp Trp Gly Ala Asn Lys Asn Arg Gln Pro Glu
        230                 235                 240

tct tca tca aaa gca tca gag gat gca aac gtc gaa gat gct ggt act      883
Ser Ser Ser Lys Ala Ser Glu Asp Ala Asn Val Glu Asp Ala Gly Thr
    245                 250                 255

gag ctt aaa aca ctg gaa cac aca tcc cat gca aca gaa cca tac aag      931
Glu Leu Lys Thr Leu Glu His Thr Ser His Ala Thr Glu Pro Tyr Lys
260                 265                 270                 275

gcg cca aac ctt ggc gtc ctt tgt gga act cag aga aaa gaa aaa gaa      979
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Application/Control Number: 09/990,444

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Ala Pro Asn Leu Gly Val Leu Cys Gly Thr Gln Arg Lys Glu Lys Glu
                280                 285                 290

ata tca tca cca tca agc tct tct gct tta agc atc ttg tct cag tcg     1027
Ile Ser Ser Pro Ser Ser Ser Ser Ala Leu Ser Ile Leu Ser Gln Ser
            295                 300                 305

cct gcc ttc aag agc cta gag gag aaa gtg ttg aag atc caa gaa agc     1075
Pro Ala Phe Lys Ser Leu Glu Glu Lys Val Leu Lys Ile Gln Glu Ser
        310                 315                 320

tgc aat aat gaa aac gat gag aat gca aac cgt aac atc atc aat atg     1123
Cys Asn Asn Glu Asn Asp Glu Asn Ala Asn Arg Asn Ile Ile Asn Met
    325                 330                 335

gag aag aat aac ggc aag gca ata gag aaa cca gtt gtg agt cat gga     1171
Glu Lys Asn Asn Gly Lys Ala Ile Glu Lys Pro Val Val Ser His Gly
340                 345                 350                 355

gtt gct tta ggc ggt gct gct gct ttg tct ctt cag aaa agc atg tac     1219
Val Ala Leu Gly Gly Ala Ala Ala Leu Ser Leu Gln Lys Ser Met Tyr
                360                 365                 370

cca ctt acc tct ctc tta acg gct cca ttg ctc acc aac tac aat aca     1267
Pro Leu Thr Ser Leu Leu Thr Ala Pro Leu Leu Thr Asn Tyr Asn Thr
            375                 380                 385

ttg gat cct ctt gca gac cct att ctc tgg aca cca ttt ctt cct tca     1315
Leu Asp Pro Leu Ala Asp Pro Ile Leu Trp Thr Pro Phe Leu Pro Ser
        390                 395                 400

gga tcc tct ctt act tca gag gtg aca aag aca gag acc agc tgt tcc     1363
Gly Ser Ser Leu Thr Ser Glu Val Thr Lys Thr Glu Thr Ser Cys Ser
    405                 410                 415

acg tac agc tac ctc cca caa gag aaa tga gccgttccct ttagacttta       1413
Thr Tyr Ser Tyr Leu Pro Gln Glu Lys
420                 425

tgtatgtcag attctccttt tttgagatga attcgtcgac ttgacatctc tttgtctctt   1473

ttatggagaa aaagttggga aaagtgtgac aatggtctga agcaggaatg tacaggtttt   1533

gttagtggtt gtgttttttt ttttccagtg tggaatatag aatcatgata ttttgtgtaa   1593

aacagaaaaa agttatcatt atagtataga agtttgctct taaaaaaaaa aaaaaaa      1650
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<210> 42 <211> 428 <212> PRT <213> Arabidopsis thaliana <400> 42

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Met Ala Ser Val Ser Ser Ser Asp Gln Gly Pro Lys Thr Glu Ala Gly
1               5                   10                  15

Cys Ser Gly Gly Gly Gly Gly Glu Ser Ser Glu Thr Val Ala Ala Ser
            20                  25                  30
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Asp Gln Met Leu Leu Tyr Arg Gly Phe Lys Lys Ala Lys Lys Glu Arg
35 40 45

Gly Cys Thr Ala Lys Glu Arg Ile Ser Lys Met Pro Pro Cys Thr Ala
50 55 60

Gly Lys Arg Ser Ser Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr
65 70 75 80

Gly Arg Tyr Glu Ala His Leu Trp Asp Lys Ser Thr Trp Asn Gln Asn
85 90 95

Gln Asn Lys Lys Gly Lys Gln Val Tyr Leu Gly Ala Tyr Asp Asp Glu
100 105 110

Glu Ala Ala Ala Arg Ala Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly
115 120 125

Pro Gly Thr Leu Ile Asn Phe Pro Val Thr Asp Tyr Thr Arg Asp Leu
130 135 140

Glu Glu Met Gln Asn Leu Ser Arg Glu Glu Tyr Leu Ala Ser Leu Arg
145 150 155 160

Arg Tyr Pro Phe Gly Arg Lys Ser Ser Gly Phe Ser Arg Gly Ile Ala
165 170 175

Lys Tyr Arg Gly Leu Gln Ser Arg Trp Asp Ala Ser Ala Ser Arg Met
180 185 190

Pro Gly Pro Glu Tyr Phe Ser Asn Ile His Tyr Gly Ala Gly Asp Asp
195 200 205

Arg Gly Thr Glu Gly Asp Phe Leu Gly Ser Phe Cys Leu Glu Arg Lys
210 215 220

Ile Asp Leu Thr Gly Tyr Ile Lys Trp Trp Gly Ala Asn Lys Asn Arg
225 230 235 240

Gln Pro Glu Ser Ser Ser Lys Ala Ser Glu Asp Ala Asn Val Glu Asp
245 250 255

Ala Gly Thr Glu Leu Lys Thr Leu Glu His Thr Ser His Ala Thr Glu
260 265 270

Pro Tyr Lys Ala Pro Asn Leu Gly Val Leu Cys Gly Thr Gln Arg Lys
275 280 285

Glu Lys Glu Ile Ser Ser Pro Ser Ser Ser Ser Ala Leu Ser Ile Leu
290 295 300

Ser Gln Ser Pro Ala Phe Lys Ser Leu Glu Glu Lys Val Leu Lys Ile
305 310 315 320

Gln Glu Ser Cys Asn Asn Glu Asn Asp Glu Asn Ala Asn Arg Asn Ile
325 330 335

Ile Asn Met Glu Lys Asn Asn Gly Lys Ala Ile Glu Lys Pro Val Val
340 345 350

Ser His Gly Val Ala Leu Gly Gly Ala Ala Ala Leu Ser Leu Gln Lys
355 360 365

Ser Met Tyr Pro Leu Thr Ser Leu Leu Thr Ala Pro Leu Leu Thr Asn
370 375 380

Tyr Asn Thr Leu Asp Pro Leu Ala Asp Pro Ile Leu Trp Thr Pro Phe
385 390 395 400

Leu Pro Ser Gly Ser Ser Leu Thr Ser Glu Val Thr Lys Thr Glu Thr
405 410 415

Ser Cys Ser Thr Tyr Ser Tyr Leu Pro Gln Glu Lys
420 425

<210> 43 <211> 933 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (20)..(757) <223> G33

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attctccccc aaccaaaat atg acc aca gaa aaa gag aat gtc act acg gcc 52
Met Thr Thr Glu Lys Glu Asn Val Thr Thr Ala
1 5 10

gtg gcc gtg aaa gac ggc gga gaa aag agt aag gaa gtg agt gac aag 100
Val Ala Val Lys Asp Gly Gly Glu Lys Ser Lys Glu Val Ser Asp Lys
15 20 25

ggc gta aag aag aga aag aat gta act aag gcc ctg gcc gtg aat gac 148

```
Gly Val Lys Lys Arg Lys Asn Val Thr Lys Ala Leu Ala Val Asn Asp
        30                  35                  40

ggc gga gaa aag agt aag gaa gtg cgt tac agg ggt gta agg agg aga      196
Gly Gly Glu Lys Ser Lys Glu Val Arg Tyr Arg Gly Val Arg Arg Arg
    45                  50                  55

cca tgg ggg aga tat gct gcg gag atc cgt gat ccg gta aag aaa aaa      244
Pro Trp Gly Arg Tyr Ala Ala Glu Ile Arg Asp Pro Val Lys Lys Lys
60                  65                  70                  75

cgg gtc tgg ctc ggg tcc ttc aac acg ggg gag gaa gcc gcc aga gcc      292
Arg Val Trp Leu Gly Ser Phe Asn Thr Gly Glu Glu Ala Ala Arg Ala
                80                  85                  90

tac gac tcc gct gcc ata agg ttt cga gga tcg aaa gct act act aac      340
Tyr Asp Ser Ala Ala Ile Arg Phe Arg Gly Ser Lys Ala Thr Thr Asn
            95                  100                 105

ttc cct cta atc gga tac tat ggg att tct tcg gcg acg ccg gtg aac      388
Phe Pro Leu Ile Gly Tyr Tyr Gly Ile Ser Ser Ala Thr Pro Val Asn
        110                 115                 120

aac aac ctt tcc gag acg gtg agt gat gga aat gcc aac ctc cct ctc      436
Asn Asn Leu Ser Glu Thr Val Ser Asp Gly Asn Ala Asn Leu Pro Leu
    125                 130                 135

gtt gga gac gat ggg aat gct ttg gct tct ccg gtg aac aac acc ctt      484
Val Gly Asp Asp Gly Asn Ala Leu Ala Ser Pro Val Asn Asn Thr Leu
140                 145                 150                 155

tcc gaa acg gcg cgt gat gga aca ctt cca tcg gat tgt cac gac atg      532
Ser Glu Thr Ala Arg Asp Gly Thr Leu Pro Ser Asp Cys His Asp Met
                160                 165                 170

tta tct ccg ggg gtg gct gaa gcg gtt gct gga ttt ttc tta gat ctg      580
Leu Ser Pro Gly Val Ala Glu Ala Val Ala Gly Phe Phe Leu Asp Leu
            175                 180                 185

cct gaa gtt att gcg ttg aaa gag gag ctt gat cga gtt tgt cct gac      628
Pro Glu Val Ile Ala Leu Lys Glu Glu Leu Asp Arg Val Cys Pro Asp
        190                 195                 200

cag ttt gag tcc att gat atg ggg ttg act att ggt cct caa acc gcc      676
Gln Phe Glu Ser Ile Asp Met Gly Leu Thr Ile Gly Pro Gln Thr Ala
    205                 210                 215

gtg gaa gag cct gag act tcc tcc gcc gtg gat tgt aag ctg cga atg      724
Val Glu Glu Pro Glu Thr Ser Ser Ala Val Asp Cys Lys Leu Arg Met
220                 225                 230                 235

gaa ccg gat ctt gac ctc aac gca agt ccc taa agattgatct gatgttgttg    777
Glu Pro Asp Leu Asp Leu Asn Ala Ser Pro
                240                 245

tccttgaata agtttgttat cttgtcgctc ttctgattgt ctgtacttct attggttgat    837
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tcgtgctttt ggaggacaaa acaaacattt ttttatgtat taaaaaaagg taattgaact 897

attatcgaaa aaaaaaaaaa aaaaaaaaaa aaaaaa 933

<210> 44 <211> 245 <212> PRT <213> Arabidopsis thaliana <400> 44

Met Thr Thr Glu Lys Glu Asn Val Thr Thr Ala Val Ala Val Lys Asp
1 5 10 15

Gly Gly Glu Lys Ser Lys Glu Val Ser Asp Lys Gly Val Lys Lys Arg
20 25 30

Lys Asn Val Thr Lys Ala Leu Ala Val Asn Asp Gly Gly Glu Lys Ser
35 40 45

Lys Glu Val Arg Tyr Arg Gly Val Arg Arg Arg Pro Trp Gly Arg Tyr
50 55 60

Ala Ala Glu Ile Arg Asp Pro Val Lys Lys Lys Arg Val Trp Leu Gly
65 70 75 80

Ser Phe Asn Thr Gly Glu Glu Ala Ala Arg Ala Tyr Asp Ser Ala Ala
85 90 95

Ile Arg Phe Arg Gly Ser Lys Ala Thr Thr Asn Phe Pro Leu Ile Gly
100 105 110

Tyr Tyr Gly Ile Ser Ser Ala Thr Pro Val Asn Asn Asn Leu Ser Glu
115 120 125

Thr Val Ser Asp Gly Asn Ala Asn Leu Pro Leu Val Gly Asp Asp Gly
130 135 140

Asn Ala Leu Ala Ser Pro Val Asn Asn Thr Leu Ser Glu Thr Ala Arg
145 150 155 160

Asp Gly Thr Leu Pro Ser Asp Cys His Asp Met Leu Ser Pro Gly Val
165 170 175

Ala Glu Ala Val Ala Gly Phe Phe Leu Asp Leu Pro Glu Val Ile Ala
180 185 190

Leu Lys Glu Glu Leu Asp Arg Val Cys Pro Asp Gln Phe Glu Ser Ile
195 200 205

```
Asp Met Gly Leu Thr Ile Gly Pro Gln Thr Ala Val Glu Glu Pro Glu
    210                 215                 220

Thr Ser Ser Ala Val Asp Cys Lys Leu Arg Met Glu Pro Asp Leu Asp
225                 230                 235                 240

Leu Asn Ala Ser Pro
                245
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<210> 45 <211> 754 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (75)..(638) <223> G39

<400> 45

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gtttccacag tccctgtact tgtgcataaa actgtaaaac actactctga aaattttgct     60

tctgttagga tata atg cca ccc tct cct cct aaa tct cct ttt att agc      110
               Met Pro Pro Ser Pro Pro Lys Ser Pro Phe Ile Ser
               1               5                   10

tct tca ctc aaa gga gct cat gaa gat cgc aaa ttt aaa tgc tat agg      158
Ser Ser Leu Lys Gly Ala His Glu Asp Arg Lys Phe Lys Cys Tyr Arg
        15                  20                  25

ggt gtc cga aag agg tct tgg ggc aaa tgg gtg tct gaa atc aga gtt      206
Gly Val Arg Lys Arg Ser Trp Gly Lys Trp Val Ser Glu Ile Arg Val
    30                  35                  40

cca aag act gga cga cga ata tgg cta ggt tca tac gat gct cca gag      254
Pro Lys Thr Gly Arg Arg Ile Trp Leu Gly Ser Tyr Asp Ala Pro Glu
45                  50                  55                  60

aag gca gct aga gcc tat gat gct gct ttg ttc tgt att agg ggt gag      302
Lys Ala Ala Arg Ala Tyr Asp Ala Ala Leu Phe Cys Ile Arg Gly Glu
               65                  70                  75

aag gga gtt tac aat ttt ccc act gat aaa aag ccg cag ctt cca gaa      350
Lys Gly Val Tyr Asn Phe Pro Thr Asp Lys Lys Pro Gln Leu Pro Glu
            80                  85                  90

ggt tct gtc cgg cct ctg tcc aag ctc gac ata cag aca ata gca aca      398
Gly Ser Val Arg Pro Leu Ser Lys Leu Asp Ile Gln Thr Ile Ala Thr
        95                  100                 105

aac tat gct tca tca gtt gtg cat gta cct tcc cat gcc acc aca ctc      446
Asn Tyr Ala Ser Ser Val Val His Val Pro Ser His Ala Thr Thr Leu
    110                 115                 120

ccg gca aca acc cag gtt ccc tct gaa gtt cct gct tcc tct gat gtt      494
Pro Ala Thr Thr Gln Val Pro Ser Glu Val Pro Ala Ser Ser Asp Val
125                 130                 135                 140

tct gct tct act gag att aca gag atg gtc gat gaa tat tat ctc cca      542
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Ser Ala Ser Thr Glu Ile Thr Glu Met Val Asp Glu Tyr Tyr Leu Pro
                145                 150                 155

acc gat gca act gca gaa tca ata ttc tca gtt gaa gac tta caa ctg      590
Thr Asp Ala Thr Ala Glu Ser Ile Phe Ser Val Glu Asp Leu Gln Leu
            160                 165                 170

gac agt ttc ctc atg atg gac att gat tgg ata aac aat cta atc tga      638
Asp Ser Phe Leu Met Met Asp Ile Asp Trp Ile Asn Asn Leu Ile
        175                 180                 185

tgtgtaacgt cacttgcagt gacatttaat atggtttaac tatcagttac ctgtctgctt    698

cttgtaaggg tatacttgga tccttgtctt tgaacttgtt ttatttagca tgcaaa        754
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<210> 46 <211> 187 <212> PRT <213> Arabidopsis thaliana <400> 46

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Met Pro Pro Ser Pro Pro Lys Ser Pro Phe Ile Ser Ser Ser Leu Lys
1               5                   10                  15

Gly Ala His Glu Asp Arg Lys Phe Lys Cys Tyr Arg Gly Val Arg Lys
            20                  25                  30

Arg Ser Trp Gly Lys Trp Val Ser Glu Ile Arg Val Pro Lys Thr Gly
        35                  40                  45

Arg Arg Ile Trp Leu Gly Ser Tyr Asp Ala Pro Glu Lys Ala Ala Arg
    50                  55                  60

Ala Tyr Asp Ala Ala Leu Phe Cys Ile Arg Gly Glu Lys Gly Val Tyr
65                  70                  75                  80

Asn Phe Pro Thr Asp Lys Lys Pro Gln Leu Pro Glu Gly Ser Val Arg
                85                  90                  95

Pro Leu Ser Lys Leu Asp Ile Gln Thr Ile Ala Thr Asn Tyr Ala Ser
            100                 105                 110

Ser Val Val His Val Pro Ser His Ala Thr Thr Leu Pro Ala Thr Thr
        115                 120                 125

Gln Val Pro Ser Glu Val Pro Ala Ser Ser Asp Val Ser Ala Ser Thr
    130                 135                 140

Glu Ile Thr Glu Met Val Asp Glu Tyr Tyr Leu Pro Thr Asp Ala Thr
145                 150                 155                 160
```

```
Ala Glu Ser Ile Phe Ser Val Glu Asp Leu Gln Leu Asp Ser Phe Leu
                165                 170                 175

Met Met Asp Ile Asp Trp Ile Asn Asn Leu Ile
            180                 185
```

<210> 47 <211> 914 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (37)..(672) <223> G147

<400> 47

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aaatcatcag atagaaggaa atattctgat tgagag atg gct cgt gga aag att       54
                                        Met Ala Arg Gly Lys Ile
                                        1               5

cag ctt aag agg att gag aac ccg gtt cac aga caa gtg act ttt tgc      102
Gln Leu Lys Arg Ile Glu Asn Pro Val His Arg Gln Val Thr Phe Cys
            10                  15                  20

aag agg aga act ggt ctt ctc aag aag gct aag gag ctc tct gtg ctc      150
Lys Arg Arg Thr Gly Leu Leu Lys Lys Ala Lys Glu Leu Ser Val Leu
        25                  30                  35

tgt gat gcc gag atc ggt gtt gtg atc ttc tct cct cag ggc aag ctc      198
Cys Asp Ala Glu Ile Gly Val Val Ile Phe Ser Pro Gln Gly Lys Leu
    40                  45                  50

ttt gag ctc gct act aaa gga aca atg gag gga atg att gat aag tac      246
Phe Glu Leu Ala Thr Lys Gly Thr Met Glu Gly Met Ile Asp Lys Tyr
55                  60                  65                  70

atg aag tgt act ggt ggt ggt cgt ggt tct tct tct gct act ttt act      294
Met Lys Cys Thr Gly Gly Gly Arg Gly Ser Ser Ser Ala Thr Phe Thr
                75                  80                  85

gct caa gaa caa ctt caa cca cca aat ctt gat ccg aaa gat gag atc      342
Ala Gln Glu Gln Leu Gln Pro Pro Asn Leu Asp Pro Lys Asp Glu Ile
            90                  95                  100

aac gtg ctt aag caa gag att gag atg ctt cag aaa ggg ata agc tat      390
Asn Val Leu Lys Gln Glu Ile Glu Met Leu Gln Lys Gly Ile Ser Tyr
        105                 110                 115

atg ttt gga gga gga gat ggg gct atg aat ctt gaa gaa ctt ctt ttg      438
Met Phe Gly Gly Gly Asp Gly Ala Met Asn Leu Glu Glu Leu Leu Leu
    120                 125                 130

ctt gag aag cat ctt gag tat tgg att tct cag att cgc tct gct aag      486
Leu Glu Lys His Leu Glu Tyr Trp Ile Ser Gln Ile Arg Ser Ala Lys
135                 140                 145                 150

atg gat gtt atg ctt caa gaa att cag tca ttg agg aac aag gaa gga      534
Met Asp Val Met Leu Gln Glu Ile Gln Ser Leu Arg Asn Lys Glu Gly
                155                 160                 165
```

gtc ctc aaa aac acc aac aag tat ctc ctc gac aag ata gag gaa aac 582
Val Leu Lys Asn Thr Asn Lys Tyr Leu Leu Asp Lys Ile Glu Glu Asn
170 175 180

aac aat agc ata tta gat gct aac ttc gca gtc atg gag aca aac tat 630
Asn Asn Ser Ile Leu Asp Ala Asn Phe Ala Val Met Glu Thr Asn Tyr
185 190 195

tcc tat ccg cta aca atg cca agt gaa ata ttt cag ttc tag 672
Ser Tyr Pro Leu Thr Met Pro Ser Glu Ile Phe Gln Phe
200 205 210

accatagggt atttgaagac tatgtctcac gaatttaaat aaccttggta agtataatat 732

agtgttgtta aatcacacat aattaaaata aagcctgtgg aacttcgcta ggcagttgaa 792

aatctatccg tatgttttat cctcttgttt tacatttgtt ggtgtgaaga tgaaatgact 852

gcaagtgtgg tgtgtactta taactctttc tactttctat ctatgttttg aatttatgga 912

tt 914

<210> 48 <211> 211 <212> PRT <213> Arabidopsis thaliana <400> 48

Met Ala Arg Gly Lys Ile Gln Leu Lys Arg Ile Glu Asn Pro Val His
1 5 10 15

Arg Gln Val Thr Phe Cys Lys Arg Arg Thr Gly Leu Leu Lys Lys Ala
20 25 30

Lys Glu Leu Ser Val Leu Cys Asp Ala Glu Ile Gly Val Val Ile Phe
35 40 45

Ser Pro Gln Gly Lys Leu Phe Glu Leu Ala Thr Lys Gly Thr Met Glu
50 55 60

Gly Met Ile Asp Lys Tyr Met Lys Cys Thr Gly Gly Gly Arg Gly Ser
65 70 75 80

Ser Ser Ala Thr Phe Thr Ala Gln Glu Gln Leu Gln Pro Pro Asn Leu
85 90 95

Asp Pro Lys Asp Glu Ile Asn Val Leu Lys Gln Glu Ile Glu Met Leu
100 105 110

Gln Lys Gly Ile Ser Tyr Met Phe Gly Gly Gly Asp Gly Ala Met Asn
115 120 125

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```
Leu Glu Glu Leu Leu Leu Leu Glu Lys His Leu Glu Tyr Trp Ile Ser
    130                 135                 140

Gln Ile Arg Ser Ala Lys Met Asp Val Met Leu Gln Glu Ile Gln Ser
145                 150                 155                 160

Leu Arg Asn Lys Glu Gly Val Leu Lys Asn Thr Asn Lys Tyr Leu Leu
                165                 170                 175

Asp Lys Ile Glu Glu Asn Asn Asn Ser Ile Leu Asp Ala Asn Phe Ala
            180                 185                 190

Val Met Glu Thr Asn Tyr Ser Tyr Pro Leu Thr Met Pro Ser Glu Ile
        195                 200                 205

Phe Gln Phe
    210
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<210> 49 <211> 1414 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (171)..(1169) <223> G158

<400> 49

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ttttgatttt ttgtgttgga ttgaagagaa gaatagttta ttgatgtttt gtgaagaaga    120

agaagaagag attttgattt tggtttaata tatagttggg gattaacagg atg gga       176
                                                        Met Gly
                                                        1

agg gta aaa ttg aag ata aag aag tta gag aac aca aat gga cgc caa      224
Arg Val Lys Leu Lys Ile Lys Lys Leu Glu Asn Thr Asn Gly Arg Gln
        5                   10                  15

tct aca ttt gct aaa agg aaa aat ggg atc ttg aaa aag gct aat gag      272
Ser Thr Phe Ala Lys Arg Lys Asn Gly Ile Leu Lys Lys Ala Asn Glu
    20                  25                  30

cta tct att ctt tgt gac att gat att gtt ctt ctt atg ttc tct cct      320
Leu Ser Ile Leu Cys Asp Ile Asp Ile Val Leu Leu Met Phe Ser Pro
35                  40                  45                  50

act ggc aag gct gca ata tgt tgc ggt aca cga aga tgt ttc tct ttc      368
Thr Gly Lys Ala Ala Ile Cys Cys Gly Thr Arg Arg Cys Phe Ser Phe
                55                  60                  65

gaa agc tca gaa ctt gaa gaa aac ttt cca aaa gtt gga tca cga tgt      416
Glu Ser Ser Glu Leu Glu Glu Asn Phe Pro Lys Val Gly Ser Arg Cys
            70                  75                  80

aaa tat acg cga att tat agc ctc aag gac ttg agt act caa gca agg      464
```

```
Lys Tyr Thr Arg Ile Tyr Ser Leu Lys Asp Leu Ser Thr Gln Ala Arg
        85                  90                  95

att ctg cag gct cgg att tct gag ata cat gga aga tta agt tat tgg      512
Ile Leu Gln Ala Arg Ile Ser Glu Ile His Gly Arg Leu Ser Tyr Trp
    100                 105                 110

acg gaa cca gat aag att aac aat gtt gaa cac ttg gga cag ctc gaa      560
Thr Glu Pro Asp Lys Ile Asn Asn Val Glu His Leu Gly Gln Leu Glu
115                 120                 125                 130

att tcg att agg caa tcc ctt gat caa ttg cgt gca cac aag atg caa      608
Ile Ser Ile Arg Gln Ser Leu Asp Gln Leu Arg Ala His Lys Met Gln
                135                 140                 145

gat ggg att cag att cct tta gaa caa cag ctt caa tct atg tca tgg      656
Asp Gly Ile Gln Ile Pro Leu Glu Gln Gln Leu Gln Ser Met Ser Trp
            150                 155                 160

att ctt aat agc aac acc acc aac att gtc acc gag gaa cac aat tca      704
Ile Leu Asn Ser Asn Thr Thr Asn Ile Val Thr Glu Glu His Asn Ser
        165                 170                 175

atc ccg cag agg gaa gtc gag tgc tca gcg agt tct tca ttc ggg agc      752
Ile Pro Gln Arg Glu Val Glu Cys Ser Ala Ser Ser Ser Phe Gly Ser
    180                 185                 190

tat cca ggc tac ttt gga aca ggg aaa tct cct gaa atg aca att ccg      800
Tyr Pro Gly Tyr Phe Gly Thr Gly Lys Ser Pro Glu Met Thr Ile Pro
195                 200                 205                 210

ggt caa gaa aca agc ttt ctt gat gaa cta aac acc gga cag ctg aaa      848
Gly Gln Glu Thr Ser Phe Leu Asp Glu Leu Asn Thr Gly Gln Leu Lys
                215                 220                 225

cag gac aca agc tcg cag cag cag ttc act aat aat aat aat atc aca      896
Gln Asp Thr Ser Ser Gln Gln Gln Phe Thr Asn Asn Asn Asn Ile Thr
            230                 235                 240

gca tac aat ccc aat ctt cac aat gat atg aat cat cac caa acg ttg      944
Ala Tyr Asn Pro Asn Leu His Asn Asp Met Asn His His Gln Thr Leu
        245                 250                 255

cct cct cct cct ctt cct ctt act ctt ccg cat gct cag gtg tat att      992
Pro Pro Pro Pro Leu Pro Leu Thr Leu Pro His Ala Gln Val Tyr Ile
    260                 265                 270

cca atg aat cag aga gag tat cat atg aat gga ttc ttt gaa gca cca     1040
Pro Met Asn Gln Arg Glu Tyr His Met Asn Gly Phe Phe Glu Ala Pro
275                 280                 285                 290

cca cct gat tct tct gct tac aac gac aac acc aac caa acc agg ttt     1088
Pro Pro Asp Ser Ser Ala Tyr Asn Asp Asn Thr Asn Gln Thr Arg Phe
                295                 300                 305

ggt tct agc agc agc tcc ttg cct tgc tca atc tca atg ttc gac gaa     1136
Gly Ser Ser Ser Ser Ser Leu Pro Cys Ser Ile Ser Met Phe Asp Glu
```

310 315 320

tac ttg ttt tcc cag atg cag cag ccg aac tga gagagatttg atgaatgatg 1189
Tyr Leu Phe Ser Gln Met Gln Gln Pro Asn
325 330

ataaaacatc tcactgaaga aactcaaacc aatatttttt ttcagaaaca gcaagaaagc 1249

taaaactctg ccgatttctg aattggttcc aagaagaaaa aaaccagtgg taatccctgg 1309

tagattgtgc aaccaaacca cacacaatac gtgttcattt atttttttcta tatcttcaat 1369

agatgtcact taattctttt ctatacataa tttctcagtc agaat 1414

<210> 50 <211> 332 <212> PRT <213> Arabidopsis thaliana <400> 50

Met Gly Arg Val Lys Leu Lys Ile Lys Lys Leu Glu Asn Thr Asn Gly
1 5 10 15

Arg Gln Ser Thr Phe Ala Lys Arg Lys Asn Gly Ile Leu Lys Lys Ala
20 25 30

Asn Glu Leu Ser Ile Leu Cys Asp Ile Asp Ile Val Leu Leu Met Phe
35 40 45

Ser Pro Thr Gly Lys Ala Ala Ile Cys Cys Gly Thr Arg Arg Cys Phe
50 55 60

Ser Phe Glu Ser Ser Glu Leu Glu Glu Asn Phe Pro Lys Val Gly Ser
65 70 75 80

Arg Cys Lys Tyr Thr Arg Ile Tyr Ser Leu Lys Asp Leu Ser Thr Gln
85 90 95

Ala Arg Ile Leu Gln Ala Arg Ile Ser Glu Ile His Gly Arg Leu Ser
100 105 110

Tyr Trp Thr Glu Pro Asp Lys Ile Asn Asn Val Glu His Leu Gly Gln
115 120 125

Leu Glu Ile Ser Ile Arg Gln Ser Leu Asp Gln Leu Arg Ala His Lys
130 135 140

Met Gln Asp Gly Ile Gln Ile Pro Leu Glu Gln Gln Leu Gln Ser Met
145 150 155 160

```
Ser Trp Ile Leu Asn Ser Asn Thr Thr Asn Ile Val Thr Glu Glu His
                165                 170                 175

Asn Ser Ile Pro Gln Arg Glu Val Glu Cys Ser Ala Ser Ser Ser Phe
            180                 185                 190

Gly Ser Tyr Pro Gly Tyr Phe Gly Thr Gly Lys Ser Pro Glu Met Thr
        195                 200                 205

Ile Pro Gly Gln Glu Thr Ser Phe Leu Asp Glu Leu Asn Thr Gly Gln
    210                 215                 220

Leu Lys Gln Asp Thr Ser Ser Gln Gln Gln Phe Thr Asn Asn Asn Asn
225                 230                 235                 240

Ile Thr Ala Tyr Asn Pro Asn Leu His Asn Asp Met Asn His His Gln
                245                 250                 255

Thr Leu Pro Pro Pro Pro Leu Pro Leu Thr Leu Pro His Ala Gln Val
            260                 265                 270

Tyr Ile Pro Met Asn Gln Arg Glu Tyr His Met Asn Gly Phe Phe Glu
        275                 280                 285

Ala Pro Pro Pro Asp Ser Ser Ala Tyr Asn Asp Asn Thr Asn Gln Thr
    290                 295                 300

Arg Phe Gly Ser Ser Ser Ser Ser Leu Pro Cys Ser Ile Ser Met Phe
305                 310                 315                 320

Asp Glu Tyr Leu Phe Ser Gln Met Gln Gln Pro Asn
                325                 330
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<210> 51 <211> 991 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (38)..(784) <223> G160

<400> 51

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tcaaatttgt catttgttta ttcaaatttt tgagaaa atg gtg aga agt acc aaa      55
                                        Met Val Arg Ser Thr Lys
                                        1               5

ggt cgt cag aaa ata gag atg aaa aaa atg gaa aac gaa agc aac ctt      103
Gly Arg Gln Lys Ile Glu Met Lys Lys Met Glu Asn Glu Ser Asn Leu
            10                  15                  20

cag gtt act ttc tca aaa aga aga ttc ggt ctt ttc aaa aaa gct agt      151
```

```
Gln Val Thr Phe Ser Lys Arg Arg Phe Gly Leu Phe Lys Lys Ala Ser
        25                  30                  35

gaa ctt tgc aca tta agt ggt gca gag att ctg ttg att gtg ttc tct      199
Glu Leu Cys Thr Leu Ser Gly Ala Glu Ile Leu Leu Ile Val Phe Ser
    40                  45                  50

cct ggt ggg aaa gtg ttt tct ttt ggc cat cca agt gtt caa gaa ctc      247
Pro Gly Gly Lys Val Phe Ser Phe Gly His Pro Ser Val Gln Glu Leu
55                  60                  65                  70

att cat cgc ttt tcg aat cct aac cat aat tct gcc att gtc cat cat      295
Ile His Arg Phe Ser Asn Pro Asn His Asn Ser Ala Ile Val His His
                75                  80                  85

cag aac aac aat ctc caa ctt gtt gaa acc cgt ccg gat aga aat atc      343
Gln Asn Asn Asn Leu Gln Leu Val Glu Thr Arg Pro Asp Arg Asn Ile
            90                  95                  100

caa tat ctc aac aat ata ctc act gag gtg ctg gca aac cag gaa aag      391
Gln Tyr Leu Asn Asn Ile Leu Thr Glu Val Leu Ala Asn Gln Glu Lys
        105                 110                 115

gag aaa cag aag aga atg gtt ttg gac cta ttg aaa gaa tcc aga gaa      439
Glu Lys Gln Lys Arg Met Val Leu Asp Leu Leu Lys Glu Ser Arg Glu
    120                 125                 130

caa gta gga aac tgg tat gaa aaa gat gtg aaa gat ctc gac atg aat      487
Gln Val Gly Asn Trp Tyr Glu Lys Asp Val Lys Asp Leu Asp Met Asn
135                 140                 145                 150

gaa acc aac cag ctg ata tct gct ctt caa gat gtg aaa aag aaa ctg      535
Glu Thr Asn Gln Leu Ile Ser Ala Leu Gln Asp Val Lys Lys Lys Leu
                155                 160                 165

gta aga gaa atg tct caa tat tct caa gta aat gtt tcg cag aat tac      583
Val Arg Glu Met Ser Gln Tyr Ser Gln Val Asn Val Ser Gln Asn Tyr
            170                 175                 180

ttt ggt caa agt tct ggc gtg att ggt ggt ggt aat gtt ggc att gat      631
Phe Gly Gln Ser Ser Gly Val Ile Gly Gly Gly Asn Val Gly Ile Asp
        185                 190                 195

ctt ttt gat caa aga aga aat gca ttc aac tat aat cca aac atg gtg      679
Leu Phe Asp Gln Arg Arg Asn Ala Phe Asn Tyr Asn Pro Asn Met Val
    200                 205                 210

ttt ccc aat cat aca cca cca atg ttt gga tac aac aat gat gga gtt      727
Phe Pro Asn His Thr Pro Pro Met Phe Gly Tyr Asn Asn Asp Gly Val
215                 220                 225                 230

ctc gtt ccg ata tcc aac atg aac tac atg tca agt tac aac ttc aac      775
Leu Val Pro Ile Ser Asn Met Asn Tyr Met Ser Ser Tyr Asn Phe Asn
                235                 240                 245

cag agc tag agtctgaagc tagaagaaca tcctaatcaa tatttgcgtt              824
Gln Ser
```

attttggcta tggttactgt taggattgtt cttgtattgt gagacttaag tttgtttttt 884

cttttaattt gtttcagttg gttggttttt cattttattc gtcgtttgtt ttcctttgtt 944

tttggatatt tttgtatccc agaataaatt tatttatcct ttaaaaa 991

<210> 52 <211> 248 <212> PRT <213> Arabidopsis thaliana <400> 52

Met Val Arg Ser Thr Lys Gly Arg Gln Lys Ile Glu Met Lys Lys Met
1 5 10 15

Glu Asn Glu Ser Asn Leu Gln Val Thr Phe Ser Lys Arg Arg Phe Gly
20 25 30

Leu Phe Lys Lys Ala Ser Glu Leu Cys Thr Leu Ser Gly Ala Glu Ile
35 40 45

Leu Leu Ile Val Phe Ser Pro Gly Gly Lys Val Phe Ser Phe Gly His
50 55 60

Pro Ser Val Gln Glu Leu Ile His Arg Phe Ser Asn Pro Asn His Asn
65 70 75 80

Ser Ala Ile Val His His Gln Asn Asn Asn Leu Gln Leu Val Glu Thr
85 90 95

Arg Pro Asp Arg Asn Ile Gln Tyr Leu Asn Asn Ile Leu Thr Glu Val
100 105 110

Leu Ala Asn Gln Glu Lys Glu Lys Gln Lys Arg Met Val Leu Asp Leu
115 120 125

Leu Lys Glu Ser Arg Glu Gln Val Gly Asn Trp Tyr Glu Lys Asp Val
130 135 140

Lys Asp Leu Asp Met Asn Glu Thr Asn Gln Leu Ile Ser Ala Leu Gln
145 150 155 160

Asp Val Lys Lys Lys Leu Val Arg Glu Met Ser Gln Tyr Ser Gln Val
165 170 175

Asn Val Ser Gln Asn Tyr Phe Gly Gln Ser Ser Gly Val Ile Gly Gly
180 185 190

```
Gly Asn Val Gly Ile Asp Leu Phe Asp Gln Arg Arg Asn Ala Phe Asn
        195                 200                 205

Tyr Asn Pro Asn Met Val Phe Pro Asn His Thr Pro Pro Met Phe Gly
    210                 215                 220

Tyr Asn Asn Asp Gly Val Leu Val Pro Ile Ser Asn Met Asn Tyr Met
225                 230                 235                 240

Ser Ser Tyr Asn Phe Asn Gln Ser
                245
```

<210> 53 <211> 837 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (54)..(629) <223> G180

<400> 53

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gtaattacga tctacaacaa gtgacatcgt cgtcgacgac gattcaagag aat atg        56
                                                          Met
                                                           1

aac ttc ctc gtt cct ttt gaa gaa acc aat gtc tta acc ttt ttc tct      104
Asn Phe Leu Val Pro Phe Glu Glu Thr Asn Val Leu Thr Phe Phe Ser
            5                  10                  15

tct tct tct tcc tct tct ctt tct tct cct tct ttc ccc att cac aac      152
Ser Ser Ser Ser Ser Ser Leu Ser Ser Pro Ser Phe Pro Ile His Asn
        20                  25                  30

tct tcc tcc act act act act cat gca cct cta ggg ttt tct aat aat      200
Ser Ser Ser Thr Thr Thr Thr His Ala Pro Leu Gly Phe Ser Asn Asn
    35                  40                  45

ctt cag ggt gga gga ccc ttg gga tca aag gtg gtt aat gat gat cag      248
Leu Gln Gly Gly Gly Pro Leu Gly Ser Lys Val Val Asn Asp Asp Gln
50                  55                  60                  65

gag aat ttt gga ggt gga act aac aat gat gct cat tct aat tct tgg      296
Glu Asn Phe Gly Gly Gly Thr Asn Asn Asp Ala His Ser Asn Ser Trp
                70                  75                  80

tgg aga tca aat agt gga agt gga gat atg aag aac aaa gtg aag ata      344
Trp Arg Ser Asn Ser Gly Ser Gly Asp Met Lys Asn Lys Val Lys Ile
            85                  90                  95

agg agg aaa cta aga gag cca aga ttc tgt ttc caa acc aaa agc gat      392
Arg Arg Lys Leu Arg Glu Pro Arg Phe Cys Phe Gln Thr Lys Ser Asp
        100                 105                 110

gtt gat gtt ctt gac gat ggc tac aaa tgg cgt aaa tat ggt cag aaa      440
Val Asp Val Leu Asp Asp Gly Tyr Lys Trp Arg Lys Tyr Gly Gln Lys
    115                 120                 125
```

```
gtc gtc aag aac agc ctt cac ccc agg agt tat tac aga tgc aca cac      488
Val Val Lys Asn Ser Leu His Pro Arg Ser Tyr Tyr Arg Cys Thr His
130                 135                 140                 145

aac aac tgt agg gtg aaa aag aga gtg gag cga cta tcg gaa gat tgt      536
Asn Asn Cys Arg Val Lys Lys Arg Val Glu Arg Leu Ser Glu Asp Cys
                150                 155                 160

aga atg gtg att act act tac gaa ggt cgt cac aac cac att ccc tct      584
Arg Met Val Ile Thr Thr Tyr Glu Gly Arg His Asn His Ile Pro Ser
            165                 170                 175

gat gac tcc act tct cct gac cat gat tgt ctc tct tcc ttt taa          629
Asp Asp Ser Thr Ser Pro Asp His Asp Cys Leu Ser Ser Phe
        180                 185                 190

catctctttc tatatatcta tatatagaca gttatatgtg cacatataga tgtgtgatat    689

attgcatatt tgatattgca tgtgtttttc aagagtatgt catcagatgt tatgcatata    749

ttcttgactt gttgcttata gtatacatat gtaataatat atattgacat tggtagttca    809

tttctgttca aacaaaaaaa aaaaaaaa                                       837
```

<210> 54 <211> 191 <212> PRT <213> Arabidopsis thaliana <400> 54

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Met Asn Phe Leu Val Pro Phe Glu Glu Thr Asn Val Leu Thr Phe Phe
1               5                   10                  15

Ser Ser Ser Ser Ser Ser Ser Leu Ser Ser Pro Ser Phe Pro Ile His
            20                  25                  30

Asn Ser Ser Ser Thr Thr Thr Thr His Ala Pro Leu Gly Phe Ser Asn
        35                  40                  45

Asn Leu Gln Gly Gly Gly Pro Leu Gly Ser Lys Val Val Asn Asp Asp
    50                  55                  60

Gln Glu Asn Phe Gly Gly Gly Thr Asn Asn Asp Ala His Ser Asn Ser
65                  70                  75                  80

Trp Trp Arg Ser Asn Ser Gly Ser Gly Asp Met Lys Asn Lys Val Lys
                85                  90                  95

Ile Arg Arg Lys Leu Arg Glu Pro Arg Phe Cys Phe Gln Thr Lys Ser
            100                 105                 110

Asp Val Asp Val Leu Asp Asp Gly Tyr Lys Trp Arg Lys Tyr Gly Gln
```

115 120 125

Lys Val Val Lys Asn Ser Leu His Pro Arg Ser Tyr Tyr Arg Cys Thr
130 135 140

His Asn Asn Cys Arg Val Lys Lys Arg Val Glu Arg Leu Ser Glu Asp
145 150 155 160

Cys Arg Met Val Ile Thr Thr Tyr Glu Gly Arg His Asn His Ile Pro
165 170 175

Ser Asp Asp Ser Thr Ser Pro Asp His Asp Cys Leu Ser Ser Phe
180 185 190

<210> 55 <211> 844 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (5)..(544) <223> G181

<400> 55

aaca atg gac aga gaa gac ata aat cct atg tta agc cgc cta gat gtc 49
Met Asp Arg Glu Asp Ile Asn Pro Met Leu Ser Arg Leu Asp Val
1 5 10 15

gaa aac aac aac acc ttc tct tcc ttt gta gac aaa acc cta atg atg 97
Glu Asn Asn Asn Thr Phe Ser Ser Phe Val Asp Lys Thr Leu Met Met
20 25 30

atg cct cca tca aca ttt tcc ggt gaa gtg gaa cct tca tct tct tct 145
Met Pro Pro Ser Thr Phe Ser Gly Glu Val Glu Pro Ser Ser Ser Ser
35 40 45

tct tgg tat cca gaa agc ttt cat gtg cat gcg ccg cca tta cca cct 193
Ser Trp Tyr Pro Glu Ser Phe His Val His Ala Pro Pro Leu Pro Pro
50 55 60

gag aat gat caa ata ggt gag aaa ggg aag gag ctg aaa gag aag aga 241
Glu Asn Asp Gln Ile Gly Glu Lys Gly Lys Glu Leu Lys Glu Lys Arg
65 70 75

tcg agg aaa gtt cca agg att gcg ttt cat acg agg agc gat gat gat 289
Ser Arg Lys Val Pro Arg Ile Ala Phe His Thr Arg Ser Asp Asp Asp
80 85 90 95

gtt ctt gat gat ggt tat cgt tgg cga aaa tat ggg cag aaa tct gtc 337
Val Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ser Val
100 105 110

aag cac aat gct cat ccc agg agc tat tac aga tgt acg tac cac aca 385
Lys His Asn Ala His Pro Arg Ser Tyr Tyr Arg Cys Thr Tyr His Thr
115 120 125

tgc aac gtg aag aaa caa gtg cag aga ttg gca aaa gat cca aac gtc 433
Cys Asn Val Lys Lys Gln Val Gln Arg Leu Ala Lys Asp Pro Asn Val

```
        130                 135                 140

gtc gta acg acc tac gaa ggc gtt cat aac cat cct tgt gag aag ctc      481
Val Val Thr Thr Tyr Glu Gly Val His Asn His Pro Cys Glu Lys Leu
    145                 150                 155

atg gag act ctt aat cct ctt ctc agg caa ctc cag ttc ctc tcc agt      529
Met Glu Thr Leu Asn Pro Leu Leu Arg Gln Leu Gln Phe Leu Ser Ser
160                 165                 170                 175

ttc tct aat ctt tga atatataatg gcttaattaa tggtgtaatt acttaaaggt      584
Phe Ser Asn Leu

gattaaggtg ttaatcaccc cactgaccgt ttgacgaccc acatctccca agtgacaagt     644

cacaagtgtg tagatcagat tttaaaccaa tgtaacagtt acgacttttt acaaatgttt     704

ctgaatttta tcccctgatt tctggttaat gatcggttta cgccgatgat ttgacaaata     764

ccagacaaaa caagtttagt tacatatgta agtatgaaaa ggtagtttcc tctaacttca     824

ttaaaaaaaa aaaaaaaaaa                                                844

<210>  56 <211>  179 <212>  PRT <213>  Arabidopsis thaliana  <400>  56

Met Asp Arg Glu Asp Ile Asn Pro Met Leu Ser Arg Leu Asp Val Glu
1               5                   10                  15

Asn Asn Asn Thr Phe Ser Ser Phe Val Asp Lys Thr Leu Met Met Met
            20                  25                  30

Pro Pro Ser Thr Phe Ser Gly Glu Val Glu Pro Ser Ser Ser Ser Ser
        35                  40                  45

Trp Tyr Pro Glu Ser Phe His Val His Ala Pro Pro Leu Pro Pro Glu
    50                  55                  60

Asn Asp Gln Ile Gly Glu Lys Gly Lys Glu Leu Lys Glu Lys Arg Ser
65                  70                  75                  80

Arg Lys Val Pro Arg Ile Ala Phe His Thr Arg Ser Asp Asp Asp Val
                85                  90                  95

Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ser Val Lys
            100                 105                 110

His Asn Ala His Pro Arg Ser Tyr Tyr Arg Cys Thr Tyr His Thr Cys
        115                 120                 125
```

Application/Control Number: 09/966,854

```
Asn Val Lys Lys Gln Val Gln Arg Leu Ala Lys Asp Pro Asn Val Val
    130                 135                 140

Val Thr Thr Tyr Glu Gly Val His Asn His Pro Cys Glu Lys Leu Met
145                 150                 155                 160

Glu Thr Leu Asn Pro Leu Leu Arg Gln Leu Gln Phe Leu Ser Ser Phe
                165                 170                 175

Ser Asn Leu
```

<210> 57 <211> 1974 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (327)..(1937) <223> G184

<400> 57

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tgaattctag ccttttttgta ggcgaatcat ctggaccggt aagagactct ctcatcgata     60

ataaccacat aatttaatca aactctttct ctctctttct aagatctttt gctttgctct    120

tttccttttt gatcttccta tatatggaga agcaccaaaa cggtacttac tatacgatac    180

tgtacggatc catcaaactg gattaattat caaaacgtac atttttatct tacctggcaa    240

gttacattcc tagggttttg gagaatccaa tcaacaacaa agaaaataat catcgttaca    300

ataatcagta tcacgcacag acttag atg ttc cgg ttt cca gtg agt cta ggc      353
                              Met Phe Arg Phe Pro Val Ser Leu Gly
                              1               5

ggt tca cgt gac gaa gac cgt cac gat cag atc aca ccg ttg gat gac       401
Gly Ser Arg Asp Glu Asp Arg His Asp Gln Ile Thr Pro Leu Asp Asp
10                  15                  20                  25

cat cgt gtg gtg gtt gat gag gtt gac ttc ttc tca gag aag aga gat       449
His Arg Val Val Val Asp Glu Val Asp Phe Phe Ser Glu Lys Arg Asp
                30                  35                  40

agg gtt tca cgt gag aac atc aac gac gac gac gac gaa ggc aat aag       497
Arg Val Ser Arg Glu Asn Ile Asn Asp Asp Asp Asp Glu Gly Asn Lys
            45                  50                  55

gtt ctc atc aaa atg gag ggt tca cga gtt gaa gaa aac gat cgt tcc       545
Val Leu Ile Lys Met Glu Gly Ser Arg Val Glu Glu Asn Asp Arg Ser
        60                  65                  70

aga gat gtc aat atc ggt ctg aat ctt ctg acc gcg aat acg gga agc       593
Arg Asp Val Asn Ile Gly Leu Asn Leu Leu Thr Ala Asn Thr Gly Ser
    75                  80                  85

gat gag tca acg gtg gat gat gga cta tca atg gat atg gaa gat aaa       641
```

```
Asp Glu Ser Thr Val Asp Asp Gly Leu Ser Met Asp Met Glu Asp Lys
90                  95                  100                 105

cgt gca aag att gag aac gca caa cta caa gaa gag ctc aag aag atg      689
Arg Ala Lys Ile Glu Asn Ala Gln Leu Gln Glu Glu Leu Lys Lys Met
                110                 115                 120

aaa ata gag aat caa agg cta aga gat atg ttg agc caa gcg acg acc      737
Lys Ile Glu Asn Gln Arg Leu Arg Asp Met Leu Ser Gln Ala Thr Thr
            125                 130                 135

aac ttc aat gcc tta caa atg caa ctt gtt gcc gtc atg agg caa caa      785
Asn Phe Asn Ala Leu Gln Met Gln Leu Val Ala Val Met Arg Gln Gln
        140                 145                 150

gaa caa cgt aac tct tca caa gat cat ctc ctg gag agc aaa gca gaa      833
Glu Gln Arg Asn Ser Ser Gln Asp His Leu Leu Glu Ser Lys Ala Glu
    155                 160                 165

gga agg aaa cgg cag gaa ctg caa atc atg gtg cca agg cag ttc atg      881
Gly Arg Lys Arg Gln Glu Leu Gln Ile Met Val Pro Arg Gln Phe Met
170                 175                 180                 185

gac ctt ggg ccg tcg tct gga gca gca gag cat gga gcc gaa gtg tca      929
Asp Leu Gly Pro Ser Ser Gly Ala Ala Glu His Gly Ala Glu Val Ser
                190                 195                 200

tct gaa gag agg aca acg gtt cgt tca ggt tct cct cct tcg ctt cta      977
Ser Glu Glu Arg Thr Thr Val Arg Ser Gly Ser Pro Pro Ser Leu Leu
            205                 210                 215

gaa agt tcc aat ccc cga gag aac gga aag agg ttg ctt gga aga gaa     1025
Glu Ser Ser Asn Pro Arg Glu Asn Gly Lys Arg Leu Leu Gly Arg Glu
        220                 225                 230

gaa agc tca gag gaa tca gag tct aac gcc tgg gga aac cct aac aaa     1073
Glu Ser Ser Glu Glu Ser Glu Ser Asn Ala Trp Gly Asn Pro Asn Lys
    235                 240                 245

gtc ccc aaa cat aat cca tcc tct agc aat agc aat gga aac aga aac     1121
Val Pro Lys His Asn Pro Ser Ser Ser Asn Ser Asn Gly Asn Arg Asn
250                 255                 260                 265

gga aat gtt att gat cag tcg gcc gca gaa gcc acc atg cgg aaa gcc     1169
Gly Asn Val Ile Asp Gln Ser Ala Ala Glu Ala Thr Met Arg Lys Ala
                270                 275                 280

cgt gtc tca gtt cgt gcc cga tct gaa gct gcc atg ata agc gat gga     1217
Arg Val Ser Val Arg Ala Arg Ser Glu Ala Ala Met Ile Ser Asp Gly
            285                 290                 295

tgt caa tgg aga aag tac gga caa aaa atg gct aaa gga aac ccg tgt     1265
Cys Gln Trp Arg Lys Tyr Gly Gln Lys Met Ala Lys Gly Asn Pro Cys
        300                 305                 310

ccg cgg gct tat tat cgt tgc aca atg gcc ggt gga tgt cca gtt cgc     1313
Pro Arg Ala Tyr Tyr Arg Cys Thr Met Ala Gly Gly Cys Pro Val Arg
```

Replacement Sheet - 09/09/2005

```
    315                 320                 325

aag caa gtg cag cgt tgc gca gaa gac aga tct att ctc ata acc acc     1361
Lys Gln Val Gln Arg Cys Ala Glu Asp Arg Ser Ile Leu Ile Thr Thr
330                 335                 340                 345

tac gaa gga aac cac aac cat cca ctc cca cca gcc gct acg gcc atg     1409
Tyr Glu Gly Asn His Asn His Pro Leu Pro Pro Ala Ala Thr Ala Met
                350                 355                 360

gcc tca aca acc acc gca gct gca agc atg ctc ctc tcg ggc tca atg     1457
Ala Ser Thr Thr Thr Ala Ala Ala Ser Met Leu Leu Ser Gly Ser Met
            365                 370                 375

tcg agt caa gac ggt tta atg aac cca aca aac ctc cta gct cga gct     1505
Ser Ser Gln Asp Gly Leu Met Asn Pro Thr Asn Leu Leu Ala Arg Ala
        380                 385                 390

atc ttg cct tgc tcc tca agc atg gct aca atc tca gcc tcc gca cca     1553
Ile Leu Pro Cys Ser Ser Ser Met Ala Thr Ile Ser Ala Ser Ala Pro
    395                 400                 405

ttc cca acc atc aca ttg gac ctc acc aat tca ccc aac ggt aac aac     1601
Phe Pro Thr Ile Thr Leu Asp Leu Thr Asn Ser Pro Asn Gly Asn Asn
410                 415                 420                 425

cct aat atg acc act aat aac ccg ttg atg cag ttc gct caa cgg ccc     1649
Pro Asn Met Thr Thr Asn Asn Pro Leu Met Gln Phe Ala Gln Arg Pro
                430                 435                 440

ggt ttc aac ccg gca gtt ttg cct caa gtg gtt ggt caa gct atg tac     1697
Gly Phe Asn Pro Ala Val Leu Pro Gln Val Val Gly Gln Ala Met Tyr
            445                 450                 455

aat aac caa caa cag tcc aag ttt tct ggt tta cag tta ccg gct cag     1745
Asn Asn Gln Gln Gln Ser Lys Phe Ser Gly Leu Gln Leu Pro Ala Gln
        460                 465                 470

cca ctg cag atc gcg gcc act tcc tcg gtg gcc gag agc gtt agt gct     1793
Pro Leu Gln Ile Ala Ala Thr Ser Ser Val Ala Glu Ser Val Ser Ala
    475                 480                 485

gcc agt gca gca att gcg tcc gat cca aac ttt gcg gcg gct cta gcg     1841
Ala Ser Ala Ala Ile Ala Ser Asp Pro Asn Phe Ala Ala Ala Leu Ala
490                 495                 500                 505

gca gcg atc acg tcc att atg aac ggt tcc agt cat caa aat aat aac     1889
Ala Ala Ile Thr Ser Ile Met Asn Gly Ser Ser His Gln Asn Asn Asn
                510                 515                 520

acc aat aat aat aat gtg gct acg agc aac aat gac agt agg caa taa     1937
Thr Asn Asn Asn Asn Val Ala Thr Ser Asn Asn Asp Ser Arg Gln
            525                 530                 535

gagttttcat tttgatggtc gatttttttt tttgggg                           1974
```

<210> 58 <211> 536 <212> PRT <213> Arabidopsis thaliana <400> 58

Met Phe Arg Phe Pro Val Ser Leu Gly Gly Ser Arg Asp Glu Asp Arg
1 5 10 15

His Asp Gln Ile Thr Pro Leu Asp Asp His Arg Val Val Val Asp Glu
20 25 30

Val Asp Phe Phe Ser Glu Lys Arg Asp Arg Val Ser Arg Glu Asn Ile
35 40 45

Asn Asp Asp Asp Asp Glu Gly Asn Lys Val Leu Ile Lys Met Glu Gly
50 55 60

Ser Arg Val Glu Glu Asn Asp Arg Ser Arg Asp Val Asn Ile Gly Leu
65 70 75 80

Asn Leu Leu Thr Ala Asn Thr Gly Ser Asp Glu Ser Thr Val Asp Asp
85 90 95

Gly Leu Ser Met Asp Met Glu Asp Lys Arg Ala Lys Ile Glu Asn Ala
100 105 110

Gln Leu Gln Glu Glu Leu Lys Lys Met Lys Ile Glu Asn Gln Arg Leu
115 120 125

Arg Asp Met Leu Ser Gln Ala Thr Thr Asn Phe Asn Ala Leu Gln Met
130 135 140

Gln Leu Val Ala Val Met Arg Gln Gln Glu Gln Arg Asn Ser Ser Gln
145 150 155 160

Asp His Leu Leu Glu Ser Lys Ala Glu Gly Arg Lys Arg Gln Glu Leu
165 170 175

Gln Ile Met Val Pro Arg Gln Phe Met Asp Leu Gly Pro Ser Ser Gly
180 185 190

Ala Ala Glu His Gly Ala Glu Val Ser Ser Glu Glu Arg Thr Thr Val
195 200 205

Arg Ser Gly Ser Pro Pro Ser Leu Leu Glu Ser Ser Asn Pro Arg Glu
210 215 220

Asn Gly Lys Arg Leu Leu Gly Arg Glu Glu Ser Ser Glu Glu Ser Glu
225 230 235 240

Ser Asn Ala Trp Gly Asn Pro Asn Lys Val Pro Lys His Asn Pro Ser
245 250 255

Ser Ser Asn Ser Asn Gly Asn Arg Asn Gly Asn Val Ile Asp Gln Ser
260 265 270

Ala Ala Glu Ala Thr Met Arg Lys Ala Arg Val Ser Val Arg Ala Arg
275 280 285

Ser Glu Ala Ala Met Ile Ser Asp Gly Cys Gln Trp Arg Lys Tyr Gly
290 295 300

Gln Lys Met Ala Lys Gly Asn Pro Cys Pro Arg Ala Tyr Tyr Arg Cys
305 310 315 320

Thr Met Ala Gly Gly Cys Pro Val Arg Lys Gln Val Gln Arg Cys Ala
325 330 335

Glu Asp Arg Ser Ile Leu Ile Thr Thr Tyr Glu Gly Asn His Asn His
340 345 350

Pro Leu Pro Pro Ala Ala Thr Ala Met Ala Ser Thr Thr Thr Ala Ala
355 360 365

Ala Ser Met Leu Leu Ser Gly Ser Met Ser Ser Gln Asp Gly Leu Met
370 375 380

Asn Pro Thr Asn Leu Leu Ala Arg Ala Ile Leu Pro Cys Ser Ser Ser
385 390 395 400

Met Ala Thr Ile Ser Ala Ser Ala Pro Phe Pro Thr Ile Thr Leu Asp
405 410 415

Leu Thr Asn Ser Pro Asn Gly Asn Asn Pro Asn Met Thr Thr Asn Asn
420 425 430

Pro Leu Met Gln Phe Ala Gln Arg Pro Gly Phe Asn Pro Ala Val Leu
435 440 445

```
Pro Gln Val Val Gly Gln Ala Met Tyr Asn Asn Gln Gln Gln Ser Lys
    450                 455                 460

Phe Ser Gly Leu Gln Leu Pro Ala Gln Pro Leu Gln Ile Ala Ala Thr
465                 470                 475                 480

Ser Ser Val Ala Glu Ser Val Ser Ala Ala Ser Ala Ala Ile Ala Ser
                485                 490                 495

Asp Pro Asn Phe Ala Ala Ala Leu Ala Ala Ala Ile Thr Ser Ile Met
            500                 505                 510

Asn Gly Ser Ser His Gln Asn Asn Asn Thr Asn Asn Asn Asn Val Ala
        515                 520                 525

Thr Ser Asn Asn Asp Ser Arg Gln
    530                 535
```

<210> 59 <211> 1205 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (77)..(988) <223> G185

<400> 59

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atgcaaaaat aaacatagta acaatacttt aaactattta caccacttta atcttattct     60

ccactctttg aacgta atg gag aag aac cat agt agt gga gag tgg gag aag     112
                  Met Glu Lys Asn His Ser Ser Gly Glu Trp Glu Lys
                  1               5                  10

atg aag aac gag atc aac gag cta atg ata gaa gga aga gac tat gca      160
Met Lys Asn Glu Ile Asn Glu Leu Met Ile Glu Gly Arg Asp Tyr Ala
        15                  20                  25

cac cag ttt gga tca gct tca tct caa gaa aca cgt gaa cat tta gcc      208
His Gln Phe Gly Ser Ala Ser Ser Gln Glu Thr Arg Glu His Leu Ala
    30                  35                  40

aaa aag att ctt caa tct tac cac aag tct ctc acc atc atg aac tac      256
Lys Lys Ile Leu Gln Ser Tyr His Lys Ser Leu Thr Ile Met Asn Tyr
45                  50                  55                  60

tcc ggc gaa ctt gac caa gtt tct cag ggt gga gga agc ccc aag agc      304
Ser Gly Glu Leu Asp Gln Val Ser Gln Gly Gly Gly Ser Pro Lys Ser
                65                  70                  75

gat gat tcc gat caa gaa cca ctt gtc atc aag agt tcg aag aag tca      352
Asp Asp Ser Asp Gln Glu Pro Leu Val Ile Lys Ser Ser Lys Lys Ser
            80                  85                  90

atg cca agg tgg agt tca aaa gtc aga att gcc cct gga gct ggt gtt      400
Met Pro Arg Trp Ser Ser Lys Val Arg Ile Ala Pro Gly Ala Gly Val
        95                  100                 105
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gat aga acg ctg gac gat gga ttc agt tgg aga aag tac ggc cag aag      448
Asp Arg Thr Leu Asp Asp Gly Phe Ser Trp Arg Lys Tyr Gly Gln Lys
    110                 115                 120

gat att ctc gga gcc aaa ttt cca aga gga tac tat aga tgc acg tat      496
Asp Ile Leu Gly Ala Lys Phe Pro Arg Gly Tyr Tyr Arg Cys Thr Tyr
125                 130                 135                 140

aga aag tct caa gga tgt gaa gcc act aaa caa gtc caa aga tct gat      544
Arg Lys Ser Gln Gly Cys Glu Ala Thr Lys Gln Val Gln Arg Ser Asp
                145                 150                 155

gaa aat cag atg ctc ctt gag atc agt tac cga gga ata cat tct tgc      592
Glu Asn Gln Met Leu Leu Glu Ile Ser Tyr Arg Gly Ile His Ser Cys
            160                 165                 170

tct caa gct gca aat gtc ggt aca aca atg ccg ata caa aac ctc gaa      640
Ser Gln Ala Ala Asn Val Gly Thr Thr Met Pro Ile Gln Asn Leu Glu
        175                 180                 185

ccg aac cag acc caa gaa cac gga aat ctt gac atg gta aag gaa agt      688
Pro Asn Gln Thr Gln Glu His Gly Asn Leu Asp Met Val Lys Glu Ser
    190                 195                 200

gta gac aac tac aat cac caa gca cat ttg cat cac aac ctt cac tat      736
Val Asp Asn Tyr Asn His Gln Ala His Leu His His Asn Leu His Tyr
205                 210                 215                 220

cca ttg tca tct acc cca aat cta gag aat aac aat gcc tat atg ctt      784
Pro Leu Ser Ser Thr Pro Asn Leu Glu Asn Asn Asn Ala Tyr Met Leu
                225                 230                 235

caa atg cga gat caa aac atc gaa tat ttt gga tct acg agc ttc tct      832
Gln Met Arg Asp Gln Asn Ile Glu Tyr Phe Gly Ser Thr Ser Phe Ser
            240                 245                 250

agt gat cta gga act agt atc aac tac aat ttt cca gca tct ggc tcg      880
Ser Asp Leu Gly Thr Ser Ile Asn Tyr Asn Phe Pro Ala Ser Gly Ser
        255                 260                 265

gct tct cac tca gca tca aac tct ccg tcc acc gtc cct ttg gaa tcc      928
Ala Ser His Ser Ala Ser Asn Ser Pro Ser Thr Val Pro Leu Glu Ser
    270                 275                 280

ccg ttt gaa agc tat gat cca aat cat cca tat gga gga ttt ggt ggg      976
Pro Phe Glu Ser Tyr Asp Pro Asn His Pro Tyr Gly Gly Phe Gly Gly
285                 290                 295                 300

ttc tat tct tag ttatctactt aagggaggga cggaactttt tacatgacct         1028
Phe Tyr Ser

cttgattaaa gagagagttt tcataatagc taatcaattt cctattcaaa tatccgagtt   1088

ttttttctaa tcatgtttat caattgtctt attacagaag gcttattttc aggtctatgt   1148
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tgaaataaat ggatttgtac tcgtaggtat gatccttgtt atctaaaaaa aaaaaaa 1205

<210> 60 <211> 303 <212> PRT <213> Arabidopsis thaliana <400> 60

Met Glu Lys Asn His Ser Ser Gly Glu Trp Glu Lys Met Lys Asn Glu
1 5 10 15

Ile Asn Glu Leu Met Ile Glu Gly Arg Asp Tyr Ala His Gln Phe Gly
20 25 30

Ser Ala Ser Ser Gln Glu Thr Arg Glu His Leu Ala Lys Lys Ile Leu
35 40 45

Gln Ser Tyr His Lys Ser Leu Thr Ile Met Asn Tyr Ser Gly Glu Leu
50 55 60

Asp Gln Val Ser Gln Gly Gly Gly Ser Pro Lys Ser Asp Asp Ser Asp
65 70 75 80

Gln Glu Pro Leu Val Ile Lys Ser Ser Lys Lys Ser Met Pro Arg Trp
85 90 95

Ser Ser Lys Val Arg Ile Ala Pro Gly Ala Gly Val Asp Arg Thr Leu
100 105 110

Asp Asp Gly Phe Ser Trp Arg Lys Tyr Gly Gln Lys Asp Ile Leu Gly
115 120 125

Ala Lys Phe Pro Arg Gly Tyr Tyr Arg Cys Thr Tyr Arg Lys Ser Gln
130 135 140

Gly Cys Glu Ala Thr Lys Gln Val Gln Arg Ser Asp Glu Asn Gln Met
145 150 155 160

Leu Leu Glu Ile Ser Tyr Arg Gly Ile His Ser Cys Ser Gln Ala Ala
165 170 175

Asn Val Gly Thr Thr Met Pro Ile Gln Asn Leu Glu Pro Asn Gln Thr
180 185 190

Gln Glu His Gly Asn Leu Asp Met Val Lys Glu Ser Val Asp Asn Tyr
195 200 205

```
Asn His Gln Ala His Leu His His Asn Leu His Tyr Pro Leu Ser Ser
    210                 215                 220

Thr Pro Asn Leu Glu Asn Asn Asn Ala Tyr Met Leu Gln Met Arg Asp
225                 230                 235                 240

Gln Asn Ile Glu Tyr Phe Gly Ser Thr Ser Phe Ser Ser Asp Leu Gly
                245                 250                 255

Thr Ser Ile Asn Tyr Asn Phe Pro Ala Ser Gly Ser Ala Ser His Ser
            260                 265                 270

Ala Ser Asn Ser Pro Ser Thr Val Pro Leu Glu Ser Pro Phe Glu Ser
        275                 280                 285

Tyr Asp Pro Asn His Pro Tyr Gly Gly Phe Gly Gly Phe Tyr Ser
    290                 295                 300
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                                                        Met Ser
                                                        1

cat gaa atc aaa gat ctt aac aac tat cac tac act tca tcg tat aat       104
His Glu Ile Lys Asp Leu Asn Asn Tyr His Tyr Thr Ser Ser Tyr Asn
        5                   10                  15

cat tac aat atc aac aac caa aat atg att aat ctc cct tac gtt tct       152
His Tyr Asn Ile Asn Asn Gln Asn Met Ile Asn Leu Pro Tyr Val Ser
    20                  25                  30

ggt cca tct gct tat aat gca aac atg atc tca tca tca caa gta ggt       200
Gly Pro Ser Ala Tyr Asn Ala Asn Met Ile Ser Ser Ser Gln Val Gly
35                  40                  45                  50

ttt gat cta ccc tcg aag aac ttg agt cct caa gga gcc ttc gag ttg       248
Phe Asp Leu Pro Ser Lys Asn Leu Ser Pro Gln Gly Ala Phe Glu Leu
                55                  60                  65

ggt ttc gag ctt tct cca tct tct tct gac ttt ttt aat cct tcc ctc       296
Gly Phe Glu Leu Ser Pro Ser Ser Ser Asp Phe Phe Asn Pro Ser Leu
            70                  75                  80

gat caa gag aac ggt ttg tat aat gct tat aat tat aat agt agt caa       344
Asp Gln Glu Asn Gly Leu Tyr Asn Ala Tyr Asn Tyr Asn Ser Ser Gln
        85                  90                  95

aag agt cat gaa gtt gtc ggt gat ggt tgt gca acc att aag agt gaa       392
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Lys Ser His Glu Val Val Gly Asp Gly Cys Ala Thr Ile Lys Ser Glu
    100                 105                 110

gtt agg gtt tca gca tct cct tct tca agt gag gcc gat cat cat cca      440
Val Arg Val Ser Ala Ser Pro Ser Ser Ser Glu Ala Asp His His Pro
115                 120                 125                 130

gga gaa gat tcc ggc aag atc cgg aag aaa aga gaa gtt cgc gat gga      488
Gly Glu Asp Ser Gly Lys Ile Arg Lys Lys Arg Glu Val Arg Asp Gly
                135                 140                 145

gga gaa gat gat caa cgc tct cag aaa gta gtt aaa aca aag aag aaa      536
Gly Glu Asp Asp Gln Arg Ser Gln Lys Val Val Lys Thr Lys Lys Lys
            150                 155                 160

gag gag aag aaa aaa gag cca cga gtc tcg ttc atg act aag acc gaa      584
Glu Glu Lys Lys Lys Glu Pro Arg Val Ser Phe Met Thr Lys Thr Glu
        165                 170                 175

gtt gat cat ctc gaa gac ggc tat cgt tgg aga aag tat ggc caa aaa      632
Val Asp His Leu Glu Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys
    180                 185                 190

gca gtc aaa aac agt cct tat ccg agg agt tac tat aga tgc acg act      680
Ala Val Lys Asn Ser Pro Tyr Pro Arg Ser Tyr Tyr Arg Cys Thr Thr
195                 200                 205                 210

cag aag tgc aac gtg aag aag aga gtg gag aga tct tac caa gac cca      728
Gln Lys Cys Asn Val Lys Lys Arg Val Glu Arg Ser Tyr Gln Asp Pro
                215                 220                 225

acg gtc gtc atc aca acc tac gag agt caa cac aac cat ccg atc ccg      776
Thr Val Val Ile Thr Thr Tyr Glu Ser Gln His Asn His Pro Ile Pro
            230                 235                 240

acc aat cgt cgg aca gca atg ttc tct gga acc acc gca tct gat tat      824
Thr Asn Arg Arg Thr Ala Met Phe Ser Gly Thr Thr Ala Ser Asp Tyr
        245                 250                 255

aac cca tca tcg tct cca ata ttc tcc gat ctc atc atc aat act cca      872
Asn Pro Ser Ser Ser Pro Ile Phe Ser Asp Leu Ile Ile Asn Thr Pro
    260                 265                 270

aga agc ttc tca aat gat gat ctc ttc cgt gtg cca tac gct agt gtg      920
Arg Ser Phe Ser Asn Asp Asp Leu Phe Arg Val Pro Tyr Ala Ser Val
275                 280                 285                 290

aac gtg aac cct agt tat cat caa cag caa cat gga ttt cat caa cag      968
Asn Val Asn Pro Ser Tyr His Gln Gln Gln His Gly Phe His Gln Gln
                295                 300                 305

gag agt gag ttc gag ctc ttg aag gag atg ttt cct tcg gtt ttc ttc     1016
Glu Ser Glu Phe Glu Leu Leu Lys Glu Met Phe Pro Ser Val Phe Phe
            310                 315                 320

aaa caa gag cct tga tgatataata taatatagaa acaatttttt ttctgctaag     1071
Lys Gln Glu Pro
```

325

aaatatagaa caaaacttgg atgcataata agtgatgata gtgttattta ttttttgcat 1131

gtatatatta tacatgtttt gttaactagc tataggatat actggtagta attaagcata 1191

aatatggagc ccttcgactt attacaataa tttttggtat ggaaaaaatt 1241

<210> 62 <211> 326 <212> PRT <213> Arabidopsis thaliana <400> 62

Met Ser His Glu Ile Lys Asp Leu Asn Asn Tyr His Tyr Thr Ser Ser
1 5 10 15

Tyr Asn His Tyr Asn Ile Asn Asn Gln Asn Met Ile Asn Leu Pro Tyr
20 25 30

Val Ser Gly Pro Ser Ala Tyr Asn Ala Asn Met Ile Ser Ser Ser Gln
35 40 45

Val Gly Phe Asp Leu Pro Ser Lys Asn Leu Ser Pro Gln Gly Ala Phe
50 55 60

Glu Leu Gly Phe Glu Leu Ser Pro Ser Ser Ser Asp Phe Phe Asn Pro
65 70 75 80

Ser Leu Asp Gln Glu Asn Gly Leu Tyr Asn Ala Tyr Asn Tyr Asn Ser
85 90 95

Ser Gln Lys Ser His Glu Val Val Gly Asp Gly Cys Ala Thr Ile Lys
100 105 110

Ser Glu Val Arg Val Ser Ala Ser Pro Ser Ser Ser Glu Ala Asp His
115 120 125

His Pro Gly Glu Asp Ser Gly Lys Ile Arg Lys Lys Arg Glu Val Arg
130 135 140

Asp Gly Gly Glu Asp Asp Gln Arg Ser Gln Lys Val Val Lys Thr Lys
145 150 155 160

Lys Lys Glu Glu Lys Lys Lys Glu Pro Arg Val Ser Phe Met Thr Lys
165 170 175

Thr Glu Val Asp His Leu Glu Asp Gly Tyr Arg Trp Arg Lys Tyr Gly
180 185 190

Gln Lys Ala Val Lys Asn Ser Pro Tyr Pro Arg Ser Tyr Tyr Arg Cys
195 200 205

Thr Thr Gln Lys Cys Asn Val Lys Lys Arg Val Glu Arg Ser Tyr Gln
210 215 220

Asp Pro Thr Val Val Ile Thr Thr Tyr Glu Ser Gln His Asn His Pro
225 230 235 240

Ile Pro Thr Asn Arg Arg Thr Ala Met Phe Ser Gly Thr Thr Ala Ser
245 250 255

Asp Tyr Asn Pro Ser Ser Ser Pro Ile Phe Ser Asp Leu Ile Ile Asn
260 265 270

Thr Pro Arg Ser Phe Ser Asn Asp Asp Leu Phe Arg Val Pro Tyr Ala
275 280 285

Ser Val Asn Val Asn Pro Ser Tyr His Gln Gln Gln His Gly Phe His
290 295 300

Gln Gln Glu Ser Glu Phe Glu Leu Leu Lys Glu Met Phe Pro Ser Val
305 310 315 320

Phe Phe Lys Gln Glu Pro
325

<210> 63 <211> 1107 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (16)..(930) <223> G207

<400> 63
aaaagatctg tttca atg gcg gat cgt gtt aaa ggt cca tgg agt caa gaa 51
Met Ala Asp Arg Val Lys Gly Pro Trp Ser Gln Glu
1 5 10

gaa gat gag cag cta cga agg atg gtt gag aaa tac gga ccg agg aat 99
Glu Asp Glu Gln Leu Arg Arg Met Val Glu Lys Tyr Gly Pro Arg Asn
15 20 25

tgg tct gcg att agc aaa tcg att cca ggt cga tct ggt aaa tcg tgt 147
Trp Ser Ala Ile Ser Lys Ser Ile Pro Gly Arg Ser Gly Lys Ser Cys
30 35 40

aga tta cgt tgg tgt aat cag tta tct ccg gag gtt gag cat cgt cct 195
Arg Leu Arg Trp Cys Asn Gln Leu Ser Pro Glu Val Glu His Arg Pro
45 50 55 60

```
ttc tcg ccg gag gaa gat gag act att gta acc gcc cgt gct cag ttt      243
Phe Ser Pro Glu Glu Asp Glu Thr Ile Val Thr Ala Arg Ala Gln Phe
                65                  70                  75

ggt aac aag tgg gcg acg att gct cgt ctt ctt aac ggt cgt acg gat      291
Gly Asn Lys Trp Ala Thr Ile Ala Arg Leu Leu Asn Gly Arg Thr Asp
            80                  85                  90

aac gcc gtt aaa aat cac tgg aac tct acg ctt aag agg aaa tgc agc      339
Asn Ala Val Lys Asn His Trp Asn Ser Thr Leu Lys Arg Lys Cys Ser
        95                  100                 105

gga ggt gtg gcg gtt acg acg gtg acg gag acg gag gaa gat cag gat      387
Gly Gly Val Ala Val Thr Thr Val Thr Glu Thr Glu Glu Asp Gln Asp
    110                 115                 120

cgg ccg aag aag agg aga tct gtt agc ttt gat cct gct ttt gct ccg      435
Arg Pro Lys Lys Arg Arg Ser Val Ser Phe Asp Pro Ala Phe Ala Pro
125                 130                 135                 140

gtg gat act gga ttg tac atg agt cct gag agt cct aac gga atc gat      483
Val Asp Thr Gly Leu Tyr Met Ser Pro Glu Ser Pro Asn Gly Ile Asp
                145                 150                 155

gtt agt gat tct agc acg att ccg tca ccg tcg tct cct gtt gct cag      531
Val Ser Asp Ser Ser Thr Ile Pro Ser Pro Ser Ser Pro Val Ala Gln
            160                 165                 170

ctg ttt aaa cca atg ccg att tcc ggc ggt ttt acg gtg gtt ccg cag      579
Leu Phe Lys Pro Met Pro Ile Ser Gly Gly Phe Thr Val Val Pro Gln
        175                 180                 185

ccg tta ccg gtt gaa atg tct tcg tct tcg gag gat cca cct act tcg      627
Pro Leu Pro Val Glu Met Ser Ser Ser Ser Glu Asp Pro Pro Thr Ser
    190                 195                 200

ttg agt ttg tca cta cct gga gct gag aac acg agt tcg agc cat aac      675
Leu Ser Leu Ser Leu Pro Gly Ala Glu Asn Thr Ser Ser Ser His Asn
205                 210                 215                 220

aat aac aac aac gcg ttg atg ttt ccg aga ttt gag agt cag atg aag      723
Asn Asn Asn Asn Ala Leu Met Phe Pro Arg Phe Glu Ser Gln Met Lys
                225                 230                 235

att aat gta gag gag aga gga gga gga gga gaa gga cgt aga ggt gag      771
Ile Asn Val Glu Glu Arg Gly Gly Gly Gly Glu Gly Arg Arg Gly Glu
            240                 245                 250

ttt atg acg gtg gtg cag gag atg ata aaa gct gaa gtg agg agt tac      819
Phe Met Thr Val Val Gln Glu Met Ile Lys Ala Glu Val Arg Ser Tyr
        255                 260                 265

atg gcg gaa atg cag aaa aca agt ggt gga ttc gtc gtc gga ggt tta      867
Met Ala Glu Met Gln Lys Thr Ser Gly Gly Phe Val Val Gly Gly Leu
    270                 275                 280
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tac gaa tcc ggc ggc aat ggt ggt ttt agg gat tgt gga gta ata aca 915
Tyr Glu Ser Gly Gly Asn Gly Gly Phe Arg Asp Cys Gly Val Ile Thr
285 290 295 300

cct aag gtt gag tag ttttggttta gggttaaaac ttgaatcgat tggggatttt 970
Pro Lys Val Glu

caagagcatt catttttggg gtttatggta aaattaaaaa caaaaacaaa atgtacagag 1030

gaattaaaat ttctatggaa taatcttaaa tctcaaatat ttgttacttg ttttggtgat 1090

tcataaccaa aatcaaa 1107

<210> 64 <211> 304 <212> PRT <213> Arabidopsis thaliana <400> 64

Met Ala Asp Arg Val Lys Gly Pro Trp Ser Gln Glu Glu Asp Glu Gln
1 5 10 15

Leu Arg Arg Met Val Glu Lys Tyr Gly Pro Arg Asn Trp Ser Ala Ile
20 25 30

Ser Lys Ser Ile Pro Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp
35 40 45

Cys Asn Gln Leu Ser Pro Glu Val Glu His Arg Pro Phe Ser Pro Glu
50 55 60

Glu Asp Glu Thr Ile Val Thr Ala Arg Ala Gln Phe Gly Asn Lys Trp
65 70 75 80

Ala Thr Ile Ala Arg Leu Leu Asn Gly Arg Thr Asp Asn Ala Val Lys
85 90 95

Asn His Trp Asn Ser Thr Leu Lys Arg Lys Cys Ser Gly Gly Val Ala
100 105 110

Val Thr Thr Val Thr Glu Thr Glu Glu Asp Gln Asp Arg Pro Lys Lys
115 120 125

Arg Arg Ser Val Ser Phe Asp Pro Ala Phe Ala Pro Val Asp Thr Gly
130 135 140

Leu Tyr Met Ser Pro Glu Ser Pro Asn Gly Ile Asp Val Ser Asp Ser
145 150 155 160

```
Ser Thr Ile Pro Ser Pro Ser Ser Pro Val Ala Gln Leu Phe Lys Pro
                165                 170                 175

Met Pro Ile Ser Gly Gly Phe Thr Val Val Pro Gln Pro Leu Pro Val
            180                 185                 190

Glu Met Ser Ser Ser Ser Glu Asp Pro Pro Thr Ser Leu Ser Leu Ser
        195                 200                 205

Leu Pro Gly Ala Glu Asn Thr Ser Ser Ser His Asn Asn Asn Asn Asn
    210                 215                 220

Ala Leu Met Phe Pro Arg Phe Glu Ser Gln Met Lys Ile Asn Val Glu
225                 230                 235                 240

Glu Arg Gly Gly Gly Gly Glu Gly Arg Arg Gly Glu Phe Met Thr Val
                245                 250                 255

Val Gln Glu Met Ile Lys Ala Glu Val Arg Ser Tyr Met Ala Glu Met
            260                 265                 270

Gln Lys Thr Ser Gly Gly Phe Val Val Gly Gly Leu Tyr Glu Ser Gly
        275                 280                 285

Gly Asn Gly Gly Phe Arg Asp Cys Gly Val Ile Thr Pro Lys Val Glu
    290                 295                 300
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<210> 65 <211> 1209 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (41)..(1156) <223> G229

<400> 65

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ttgtggtcag tggaataaac acatataacc gccggagaaa atg gga aga gcg cca       55
                                              Met Gly Arg Ala Pro
                                              1               5

tgt tgc gag aag gtc ggt atc aag aga ggg cgg tgg acg gcg gag gag      103
Cys Cys Glu Lys Val Gly Ile Lys Arg Gly Arg Trp Thr Ala Glu Glu
                10                  15                  20

gac cag att ctc tcc aac tac att caa tcc aat ggt gaa ggt tct tgg      151
Asp Gln Ile Leu Ser Asn Tyr Ile Gln Ser Asn Gly Glu Gly Ser Trp
            25                  30                  35

aga tct ctc ccc aaa aat gcc gga tta aaa agg tgt gga aag agc tgt      199
Arg Ser Leu Pro Lys Asn Ala Gly Leu Lys Arg Cys Gly Lys Ser Cys
        40                  45                  50

aga ttg aga tgg ata aac tat cta aga tca gac ctc aag cgt gga aac      247
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```
Arg Leu Arg Trp Ile Asn Tyr Leu Arg Ser Asp Leu Lys Arg Gly Asn
    55                  60                  65

ata act cca gaa gaa gaa gaa ctc gtt gtt aaa ttg cat tcc act ttg      295
Ile Thr Pro Glu Glu Glu Glu Leu Val Val Lys Leu His Ser Thr Leu
70                  75                  80                  85

gga aac agg tgg tca cta atc gcg ggt cat cta cca ggg aga aca gac      343
Gly Asn Arg Trp Ser Leu Ile Ala Gly His Leu Pro Gly Arg Thr Asp
                90                  95                  100

aac gaa ata aaa aat tat tgg aac tct cat ctc agc cgt aaa ctc cac      391
Asn Glu Ile Lys Asn Tyr Trp Asn Ser His Leu Ser Arg Lys Leu His
            105                 110                 115

aac ttc att agg aag cca tcc atc tct caa gac gtc tcc gcc gta atc      439
Asn Phe Ile Arg Lys Pro Ser Ile Ser Gln Asp Val Ser Ala Val Ile
        120                 125                 130

atg gcg aac gct tct tca gcg cca ccg ccg ccg cag gca aaa cgc aga      487
Met Ala Asn Ala Ser Ser Ala Pro Pro Pro Pro Gln Ala Lys Arg Arg
    135                 140                 145

ctt ggg aga acg agt agg tcc gct atg aaa cca aaa atc cgc aga aca      535
Leu Gly Arg Thr Ser Arg Ser Ala Met Lys Pro Lys Ile Arg Arg Thr
150                 155                 160                 165

aaa act cgt aaa acg aag aaa acg tct gca cca ccg gag cct aac gcc      583
Lys Thr Arg Lys Thr Lys Lys Thr Ser Ala Pro Pro Glu Pro Asn Ala
                170                 175                 180

gat gta gct ggg gct gat aaa gaa gca tta atg gtg gag tca agt gga      631
Asp Val Ala Gly Ala Asp Lys Glu Ala Leu Met Val Glu Ser Ser Gly
            185                 190                 195

gcc gag gct gag cta gga cga cca tgt gac tac tat gga gat gat tgt      679
Ala Glu Ala Glu Leu Gly Arg Pro Cys Asp Tyr Tyr Gly Asp Asp Cys
        200                 205                 210

aac aaa aat ctc atg agc att aat ggc gat aat gga gtt tta acg ttt      727
Asn Lys Asn Leu Met Ser Ile Asn Gly Asp Asn Gly Val Leu Thr Phe
    215                 220                 225

gat gat gat atc atc gat ctt ttg ttg gac gag tca gat cct ggc cac      775
Asp Asp Asp Ile Ile Asp Leu Leu Leu Asp Glu Ser Asp Pro Gly His
230                 235                 240                 245

ttg tac aca aac aca acg tgc ggt ggt ggt ggg gag ttg cat aac ata      823
Leu Tyr Thr Asn Thr Thr Cys Gly Gly Gly Gly Glu Leu His Asn Ile
                250                 255                 260

aga gac tct gaa gga gcc aga ggg ttc tcg gat act tgg aac caa ggg      871
Arg Asp Ser Glu Gly Ala Arg Gly Phe Ser Asp Thr Trp Asn Gln Gly
            265                 270                 275

aat ctc gac tgt ctt ctt cag tct tgt cca tct gtg gag tcg ttt ctc      919
Asn Leu Asp Cys Leu Leu Gln Ser Cys Pro Ser Val Glu Ser Phe Leu
```

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        280                 285                 290

aac tac gac cac caa gtt aac gac gcg tcg acg gat gag ttt atc gat      967
Asn Tyr Asp His Gln Val Asn Asp Ala Ser Thr Asp Glu Phe Ile Asp
    295                 300                 305

tgg gat tgt gtt tgg caa gaa ggt agt gat aat aat ctt tgg cat gag     1015
Trp Asp Cys Val Trp Gln Glu Gly Ser Asp Asn Asn Leu Trp His Glu
310                 315                 320                 325

aaa gag aat ccc gac tca atg gtc tcg tgg ctt tta gac ggt gat gat     1063
Lys Glu Asn Pro Asp Ser Met Val Ser Trp Leu Leu Asp Gly Asp Asp
                330                 335                 340

gag gcc acg atc ggg aat agt aat tgt gag aac ttt gga gaa ccg tta     1111
Glu Ala Thr Ile Gly Asn Ser Asn Cys Glu Asn Phe Gly Glu Pro Leu
            345                 350                 355

gat cat gac gac gaa agc gct ttg gtc gct tgg ctt ctg tca tga         1156
Asp His Asp Asp Glu Ser Ala Leu Val Ala Trp Leu Leu Ser
        360                 365                 370

tgatattgat tgatccgtta tgtaatcttt tttgtgcatt cacagtttga atc          1209


<210>  66 <211>  371 <212>  PRT <213>  Arabidopsis thaliana  <400>  66

Met Gly Arg Ala Pro Cys Cys Glu Lys Val Gly Ile Lys Arg Gly Arg
1               5                   10                  15

Trp Thr Ala Glu Glu Asp Gln Ile Leu Ser Asn Tyr Ile Gln Ser Asn
            20                  25                  30

Gly Glu Gly Ser Trp Arg Ser Leu Pro Lys Asn Ala Gly Leu Lys Arg
        35                  40                  45

Cys Gly Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Ser Asp
    50                  55                  60

Leu Lys Arg Gly Asn Ile Thr Pro Glu Glu Glu Glu Leu Val Val Lys
65                  70                  75                  80

Leu His Ser Thr Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly His Leu
                85                  90                  95

Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp Asn Ser His Leu
            100                 105                 110

Ser Arg Lys Leu His Asn Phe Ile Arg Lys Pro Ser Ile Ser Gln Asp
        115                 120                 125
```

Val Ser Ala Val Ile Met Ala Asn Ala Ser Ser Ala Pro Pro Pro Pro
130 135 140

Gln Ala Lys Arg Arg Leu Gly Arg Thr Ser Arg Ser Ala Met Lys Pro
145 150 155 160

Lys Ile Arg Arg Thr Lys Thr Arg Lys Thr Lys Lys Thr Ser Ala Pro
165 170 175

Pro Glu Pro Asn Ala Asp Val Ala Gly Ala Asp Lys Glu Ala Leu Met
180 185 190

Val Glu Ser Ser Gly Ala Glu Ala Glu Leu Gly Arg Pro Cys Asp Tyr
195 200 205

Tyr Gly Asp Asp Cys Asn Lys Asn Leu Met Ser Ile Asn Gly Asp Asn
210 215 220

Gly Val Leu Thr Phe Asp Asp Asp Ile Ile Asp Leu Leu Leu Asp Glu
225 230 235 240

Ser Asp Pro Gly His Leu Tyr Thr Asn Thr Thr Cys Gly Gly Gly Gly
245 250 255

Glu Leu His Asn Ile Arg Asp Ser Glu Gly Ala Arg Gly Phe Ser Asp
260 265 270

Thr Trp Asn Gln Gly Asn Leu Asp Cys Leu Leu Gln Ser Cys Pro Ser
275 280 285

Val Glu Ser Phe Leu Asn Tyr Asp His Gln Val Asn Asp Ala Ser Thr
290 295 300

Asp Glu Phe Ile Asp Trp Asp Cys Val Trp Gln Glu Gly Ser Asp Asn
305 310 315 320

Asn Leu Trp His Glu Lys Glu Asn Pro Asp Ser Met Val Ser Trp Leu
325 330 335

Leu Asp Gly Asp Asp Glu Ala Thr Ile Gly Asn Ser Asn Cys Glu Asn
340 345 350

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Phe Gly Glu Pro Leu Asp His Asp Asp Glu Ser Ala Leu Val Ala Trp
        355                 360                 365


Leu Leu Ser
    370
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<400> 67

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ctctcaaaac caaaatcact aaagaggaga agattgctaa agtttgataa aacattccaa     60

aatca atg gct gat agg atc aaa ggt cca tgg agt cct gaa gaa gac gag    110
      Met Ala Asp Arg Ile Lys Gly Pro Trp Ser Pro Glu Glu Asp Glu
      1               5                  10                  15

cag ctt cgt agg ctt gtt gtt aaa tac ggt cca aga aac tgg aca gtg      158
Gln Leu Arg Arg Leu Val Val Lys Tyr Gly Pro Arg Asn Trp Thr Val
                20                  25                  30

att agc aaa tct att ccc ggt aga tcg ggg aaa tcg tgt cgt tta cgg      206
Ile Ser Lys Ser Ile Pro Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg
            35                  40                  45

tgg tgc aac cag ctt tcg ccg caa gtt gag cat cgg ccg ttt tcg gct      254
Trp Cys Asn Gln Leu Ser Pro Gln Val Glu His Arg Pro Phe Ser Ala
        50                  55                  60

gag gaa gac gag acg atc gca cgt gct cac gct cag ttc ggg aat aaa      302
Glu Glu Asp Glu Thr Ile Ala Arg Ala His Ala Gln Phe Gly Asn Lys
    65                  70                  75

tgg gcg acg att gct cgt ctt ctc aac ggt cgt acg gac aac gcc gtg      350
Trp Ala Thr Ile Ala Arg Leu Leu Asn Gly Arg Thr Asp Asn Ala Val
80                  85                  90                  95

aag aat cac tgg aac tcg acg ctc aag agg aaa tgc ggc ggt tac gac      398
Lys Asn His Trp Asn Ser Thr Leu Lys Arg Lys Cys Gly Gly Tyr Asp
                100                 105                 110

cat cgg ggt tac gat ggt tcg gag gat cat cgg ccg gtt aag aga tcg      446
His Arg Gly Tyr Asp Gly Ser Glu Asp His Arg Pro Val Lys Arg Ser
            115                 120                 125

gtg agt gcg gga tct cca cct gtt gtt act ggg ctt tac atg agc cca      494
Val Ser Ala Gly Ser Pro Pro Val Val Thr Gly Leu Tyr Met Ser Pro
        130                 135                 140

gga agc cca act gga tct gat gtc agt gat tca agt act atc ccg ata      542
Gly Ser Pro Thr Gly Ser Asp Val Ser Asp Ser Ser Thr Ile Pro Ile
    145                 150                 155

tta cct tcc gtt gag ctt ttc aag cct gtg cct aga cct ggt gct gtt      590
Leu Pro Ser Val Glu Leu Phe Lys Pro Val Pro Arg Pro Gly Ala Val
```

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160                 165                 170                 175

gtg cta ccg ctt cct atc gaa acg tcg tct ttt tcc gat gat cca ccg      638
Val Leu Pro Leu Pro Ile Glu Thr Ser Ser Phe Ser Asp Asp Pro Pro
                180                 185                 190

act tcg tta agc ttg tca ctt cct ggt gcc gac gta agc gag gag tca      686
Thr Ser Leu Ser Leu Ser Leu Pro Gly Ala Asp Val Ser Glu Glu Ser
            195                 200                 205

aac cgt agc cac gag tca acg aat atc aac aac acc act tcg agc cgc      734
Asn Arg Ser His Glu Ser Thr Asn Ile Asn Asn Thr Thr Ser Ser Arg
        210                 215                 220

cac aac cac aac aat acg gtg tcg ttt atg ccg ttt agt ggt ggg ttt      782
His Asn His Asn Asn Thr Val Ser Phe Met Pro Phe Ser Gly Gly Phe
    225                 230                 235

aga ggt gcg att gag gaa atg ggg aag tct ttt ccc ggt aac gga ggc      830
Arg Gly Ala Ile Glu Glu Met Gly Lys Ser Phe Pro Gly Asn Gly Gly
240                 245                 250                 255

gag ttt atg gcg gtg gtg caa gag atg att aag gcg gaa gtg agg agt      878
Glu Phe Met Ala Val Val Gln Glu Met Ile Lys Ala Glu Val Arg Ser
                260                 265                 270

tac atg acg gag atg caa cgg aac aat ggt ggc gga ttc gtc gga gga      926
Tyr Met Thr Glu Met Gln Arg Asn Asn Gly Gly Gly Phe Val Gly Gly
            275                 280                 285

ttc att gat aat ggc atg att ccg atg agt caa att gga gtt ggg aga      974
Phe Ile Asp Asn Gly Met Ile Pro Met Ser Gln Ile Gly Val Gly Arg
        290                 295                 300

atc gag tag acaaagtgag attattagga aactgtttaa attggagaag             1023
Ile Glu
    305

aagaaaaatg ctctgttttt ttctcctttg gattaggctt aagaattttg ggttttaagg   1083

aaatgtatag aggaaatcga gtgaacaaag ctcgagagct ggggacgtag tgacgaagac   1143

gaagatcaaa tttctcttaa gctattcagg aaaataaaat aaatttttat tt           1195

<210>  68 <211>  305 <212>  PRT <213>  Arabidopsis thaliana  <400>  68

Met Ala Asp Arg Ile Lys Gly Pro Trp Ser Pro Glu Glu Asp Glu Gln
1               5                   10                  15

Leu Arg Arg Leu Val Val Lys Tyr Gly Pro Arg Asn Trp Thr Val Ile
            20                  25                  30

Ser Lys Ser Ile Pro Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp
        35                  40                  45
```

Cys Asn Gln Leu Ser Pro Gln Val Glu His Arg Pro Phe Ser Ala Glu
50 55 60

Glu Asp Glu Thr Ile Ala Arg Ala His Ala Gln Phe Gly Asn Lys Trp
65 70 75 80

Ala Thr Ile Ala Arg Leu Leu Asn Gly Arg Thr Asp Asn Ala Val Lys
85 90 95

Asn His Trp Asn Ser Thr Leu Lys Arg Lys Cys Gly Gly Tyr Asp His
100 105 110

Arg Gly Tyr Asp Gly Ser Glu Asp His Arg Pro Val Lys Arg Ser Val
115 120 125

Ser Ala Gly Ser Pro Pro Val Val Thr Gly Leu Tyr Met Ser Pro Gly
130 135 140

Ser Pro Thr Gly Ser Asp Val Ser Asp Ser Ser Thr Ile Pro Ile Leu
145 150 155 160

Pro Ser Val Glu Leu Phe Lys Pro Val Pro Arg Pro Gly Ala Val Val
165 170 175

Leu Pro Leu Pro Ile Glu Thr Ser Ser Phe Ser Asp Asp Pro Pro Thr
180 185 190

Ser Leu Ser Leu Ser Leu Pro Gly Ala Asp Val Ser Glu Glu Ser Asn
195 200 205

Arg Ser His Glu Ser Thr Asn Ile Asn Asn Thr Thr Ser Ser Arg His
210 215 220

Asn His Asn Asn Thr Val Ser Phe Met Pro Phe Ser Gly Gly Phe Arg
225 230 235 240

Gly Ala Ile Glu Glu Met Gly Lys Ser Phe Pro Gly Asn Gly Gly Glu
245 250 255

Phe Met Ala Val Val Gln Glu Met Ile Lys Ala Glu Val Arg Ser Tyr
260 265 270

```
Met Thr Glu Met Gln Arg Asn Asn Gly Gly Gly Phe Val Gly Gly Phe
        275                 280                 285

Ile Asp Asn Gly Met Ile Pro Met Ser Gln Ile Gly Val Gly Arg Ile
    290                 295                 300

Glu
305
```

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<222> (1)..(660) <223> G247

<400> 69

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atg aga atg aca aga gat gga aaa gaa cat gaa tac aag aaa ggt tta       48
Met Arg Met Thr Arg Asp Gly Lys Glu His Glu Tyr Lys Lys Gly Leu
1               5                   10                  15

tgg aca gtg gaa gaa gac aag atc ctc atg gat tat gtc cga act cat       96
Trp Thr Val Glu Glu Asp Lys Ile Leu Met Asp Tyr Val Arg Thr His
            20                  25                  30

ggc cag ggc cac tgg aac cgc atc gcc aag aaa act ggg ctc aag aga      144
Gly Gln Gly His Trp Asn Arg Ile Ala Lys Lys Thr Gly Leu Lys Arg
        35                  40                  45

tgt ggg aaa agc tgt agg ttg aga tgg atg aac tac tta agc cct aat      192
Cys Gly Lys Ser Cys Arg Leu Arg Trp Met Asn Tyr Leu Ser Pro Asn
    50                  55                  60

gtt aac aga ggc aat ttt act gac caa gaa gaa gat ctc atc atc aga      240
Val Asn Arg Gly Asn Phe Thr Asp Gln Glu Glu Asp Leu Ile Ile Arg
65                  70                  75                  80

ctc cac aag ctc ctc ggc aac aga tgg tcg ttg ata gcg aaa aga gtt      288
Leu His Lys Leu Leu Gly Asn Arg Trp Ser Leu Ile Ala Lys Arg Val
                85                  90                  95

ccg gga aga aca gac aac caa gta aag aat tac tgg aac aca cat ctc      336
Pro Gly Arg Thr Asp Asn Gln Val Lys Asn Tyr Trp Asn Thr His Leu
            100                 105                 110

agc aag aaa ctt ggt ctc gga gat cat tca act gcc gtc aaa gcc gca      384
Ser Lys Lys Leu Gly Leu Gly Asp His Ser Thr Ala Val Lys Ala Ala
        115                 120                 125

tgc ggt gta gag tct cca ccg tct atg gcc ctt ata acc aca acg tcc      432
Cys Gly Val Glu Ser Pro Pro Ser Met Ala Leu Ile Thr Thr Thr Ser
    130                 135                 140

tcc tct cat caa gag atc tcc ggt gga aaa aat tca act cta agg ttc      480
Ser Ser His Gln Glu Ile Ser Gly Gly Lys Asn Ser Thr Leu Arg Phe
145                 150                 155                 160
```

```
gac act tta gtt gac gaa tcc aaa ctc aaa cca aaa tcc aaa cta gtc      528
Asp Thr Leu Val Asp Glu Ser Lys Leu Lys Pro Lys Ser Lys Leu Val
                165                 170                 175

cac gca aca cca act gac gta gaa gtt gca gct acg gtt cca aat ctg      576
His Ala Thr Pro Thr Asp Val Glu Val Ala Ala Thr Val Pro Asn Leu
            180                 185                 190

ttc gat acc ttt tgg gtt ctt gaa gac gac ttc gag ctt agt tca ctc      624
Phe Asp Thr Phe Trp Val Leu Glu Asp Asp Phe Glu Leu Ser Ser Leu
        195                 200                 205

act atg atg gat ttt act aat ggg tat tgc ctt tga                     660
Thr Met Met Asp Phe Thr Asn Gly Tyr Cys Leu
    210                 215
```

<210> 70 <211> 219 <212> PRT <213> Arabidopsis thaliana <400> 70

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Met Arg Met Thr Arg Asp Gly Lys Glu His Glu Tyr Lys Lys Gly Leu
1               5                   10                  15

Trp Thr Val Glu Glu Asp Lys Ile Leu Met Asp Tyr Val Arg Thr His
            20                  25                  30

Gly Gln Gly His Trp Asn Arg Ile Ala Lys Lys Thr Gly Leu Lys Arg
        35                  40                  45

Cys Gly Lys Ser Cys Arg Leu Arg Trp Met Asn Tyr Leu Ser Pro Asn
    50                  55                  60

Val Asn Arg Gly Asn Phe Thr Asp Gln Glu Glu Asp Leu Ile Ile Arg
65                  70                  75                  80

Leu His Lys Leu Leu Gly Asn Arg Trp Ser Leu Ile Ala Lys Arg Val
                85                  90                  95

Pro Gly Arg Thr Asp Asn Gln Val Lys Asn Tyr Trp Asn Thr His Leu
            100                 105                 110

Ser Lys Lys Leu Gly Leu Gly Asp His Ser Thr Ala Val Lys Ala Ala
        115                 120                 125

Cys Gly Val Glu Ser Pro Pro Ser Met Ala Leu Ile Thr Thr Thr Ser
    130                 135                 140

Ser Ser His Gln Glu Ile Ser Gly Gly Lys Asn Ser Thr Leu Arg Phe
145                 150                 155                 160
```

```
Asp Thr Leu Val Asp Glu Ser Lys Leu Lys Pro Lys Ser Lys Leu Val
                165                 170                 175

His Ala Thr Pro Thr Asp Val Glu Val Ala Ala Thr Val Pro Asn Leu
            180                 185                 190

Phe Asp Thr Phe Trp Val Leu Glu Asp Asp Phe Glu Leu Ser Ser Leu
        195                 200                 205

Thr Met Met Asp Phe Thr Asn Gly Tyr Cys Leu
    210                 215
```

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<210> 71 <211> 1613 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (30)..(1430) <223> G264

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cttgtaccag tttctgatta gattcaaca atg aac ggc gca tta ggt aac tcc       53
                               Met Asn Gly Ala Leu Gly Asn Ser
                               1               5

tcc gcc tcc gtt agc ggc gga gaa gga gcc gga gga cca gcg cct ttc      101
Ser Ala Ser Val Ser Gly Gly Glu Gly Ala Gly Gly Pro Ala Pro Phe
    10                  15                  20

ttg gtg aaa acc tac gag atg gtc gac gat tca tca acg gac cag atc      149
Leu Val Lys Thr Tyr Glu Met Val Asp Asp Ser Ser Thr Asp Gln Ile
25                  30                  35                  40

gta tcg tgg agc gct aac aac aac agc ttc atc gtt tgg aat cat gcc      197
Val Ser Trp Ser Ala Asn Asn Asn Ser Phe Ile Val Trp Asn His Ala
                45                  50                  55

gaa ttt tca cgc ctc ctt ctt cca acc tac ttc aaa cac aat aac ttc      245
Glu Phe Ser Arg Leu Leu Leu Pro Thr Tyr Phe Lys His Asn Asn Phe
            60                  65                  70

tct tcc ttc att cgt cag ctc aat acc tat ggg ttt agg aag att gat      293
Ser Ser Phe Ile Arg Gln Leu Asn Thr Tyr Gly Phe Arg Lys Ile Asp
        75                  80                  85

cca gag agg tgg gag ttt ttg aat gat gat ttt att aag gat cag aag      341
Pro Glu Arg Trp Glu Phe Leu Asn Asp Asp Phe Ile Lys Asp Gln Lys
    90                  95                  100

cat ctt ctc aag aat ata cat aga agg aaa cct ata cac agc cac agt      389
His Leu Leu Lys Asn Ile His Arg Arg Lys Pro Ile His Ser His Ser
105                 110                 115                 120

cat cca cct gct tcg tcg act gat caa gaa aga gca gtg ttg caa gag      437
His Pro Pro Ala Ser Ser Thr Asp Gln Glu Arg Ala Val Leu Gln Glu
                125                 130                 135
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caa atg gac aag ctt tca cgt gag aaa gct gca att gaa gct aag ctt      485
Gln Met Asp Lys Leu Ser Arg Glu Lys Ala Ala Ile Glu Ala Lys Leu
            140                 145                 150

tta aag ttc aaa caa cag aag gtt gta gca aag cat cag ttt gaa gaa      533
Leu Lys Phe Lys Gln Gln Lys Val Val Ala Lys His Gln Phe Glu Glu
        155                 160                 165

atg act gag cat gtt gat gat atg gag aat agg cag aag aag ctg ctg      581
Met Thr Glu His Val Asp Asp Met Glu Asn Arg Gln Lys Lys Leu Leu
    170                 175                 180

aat ttt ttg gaa act gcg att cgg aat cct act ttt gtt aag aat ttt      629
Asn Phe Leu Glu Thr Ala Ile Arg Asn Pro Thr Phe Val Lys Asn Phe
185                 190                 195                 200

ggt aag aaa gtc gag cag ttg gat att tca gct tac aac aaa aag cga      677
Gly Lys Lys Val Glu Gln Leu Asp Ile Ser Ala Tyr Asn Lys Lys Arg
                205                 210                 215

agg ctc cct gaa gtt gag caa tca aag cca cct tca gaa gat tct cat      725
Arg Leu Pro Glu Val Glu Gln Ser Lys Pro Pro Ser Glu Asp Ser His
            220                 225                 230

ctg gat aat agt agt ggt agc tcg aga cgc gag tct gga aac att ttt      773
Leu Asp Asn Ser Ser Gly Ser Ser Arg Arg Glu Ser Gly Asn Ile Phe
        235                 240                 245

cat caa aat ttc tct aat aaa ttg cga cta gag ctt tct cca gct gat      821
His Gln Asn Phe Ser Asn Lys Leu Arg Leu Glu Leu Ser Pro Ala Asp
    250                 255                 260

tca gat atg aac atg gtt tca cac agt ata caa agt tcc aat gaa gaa      869
Ser Asp Met Asn Met Val Ser His Ser Ile Gln Ser Ser Asn Glu Glu
265                 270                 275                 280

ggt gcg agt ccc aaa ggg ata ctg tca gga ggt gat cca aat act aca      917
Gly Ala Ser Pro Lys Gly Ile Leu Ser Gly Gly Asp Pro Asn Thr Thr
                285                 290                 295

cta aca aaa aga gaa ggc cta cca ttt gca cct gaa gct cta gag ctt      965
Leu Thr Lys Arg Glu Gly Leu Pro Phe Ala Pro Glu Ala Leu Glu Leu
            300                 305                 310

gcg gat acc ggg aca tgc ccg agg aga tta ctg tta aat gat aat aca     1013
Ala Asp Thr Gly Thr Cys Pro Arg Arg Leu Leu Leu Asn Asp Asn Thr
        315                 320                 325

agg gtg gag acc ttg cag cag agg cta act tct tca gag gag act gat     1061
Arg Val Glu Thr Leu Gln Gln Arg Leu Thr Ser Ser Glu Glu Thr Asp
    330                 335                 340

ggt agc ttt tca tgt cat tta aat cta acc ctg gct tct gct ccg tta     1109
Gly Ser Phe Ser Cys His Leu Asn Leu Thr Leu Ala Ser Ala Pro Leu
345                 350                 355                 360
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ccg gac aaa aca gct tca cag ata gct aag acg act ctt aaa agt cag     1157
Pro Asp Lys Thr Ala Ser Gln Ile Ala Lys Thr Thr Leu Lys Ser Gln
                365                 370                 375

gag tta aac ttt aac tca ata gaa aca agt gca agt gag aaa aat cgg     1205
Glu Leu Asn Phe Asn Ser Ile Glu Thr Ser Ala Ser Glu Lys Asn Arg
            380                 385                 390

ggt aga caa gag att gca gtt gga ggt agc caa gca aat gca gct cct     1253
Gly Arg Gln Glu Ile Ala Val Gly Gly Ser Gln Ala Asn Ala Ala Pro
        395                 400                 405

cca gca aga gtg aat gat gta ttc tgg gaa cag ttc cta aca gaa agg     1301
Pro Ala Arg Val Asn Asp Val Phe Trp Glu Gln Phe Leu Thr Glu Arg
    410                 415                 420

cca ggg tct tca gat aat gag gag gca agt tcg act tat aga ggt aac     1349
Pro Gly Ser Ser Asp Asn Glu Glu Ala Ser Ser Thr Tyr Arg Gly Asn
425                 430                 435                 440

cca tac gaa gag caa gag gag aaa aga aac ggg agt atg atg tta cgt     1397
Pro Tyr Glu Glu Gln Glu Glu Lys Arg Asn Gly Ser Met Met Leu Arg
                445                 450                 455

aat aca aag aat atc gag cag ctg acc tta taa actatttgga cggttacatc   1450
Asn Thr Lys Asn Ile Glu Gln Leu Thr Leu
            460                 465

aacgagagta cgaactgagg ttttggtaag aagtatgggt gagtaagtaa tgaaacattg   1510

gactgaaaaa gcgtaagtag ctttgttgta aacacttgcg tctctgtcta cacaagtaat   1570

ttgactgtaa atgtaagtgt acaggattta aattgaataa gca                     1613
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<210> 72 <211> 466 <212> PRT <213> Arabidopsis thaliana <400> 72

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Met Asn Gly Ala Leu Gly Asn Ser Ser Ala Ser Val Ser Gly Gly Glu
1               5                   10                  15

Gly Ala Gly Gly Pro Ala Pro Phe Leu Val Lys Thr Tyr Glu Met Val
            20                  25                  30

Asp Asp Ser Ser Thr Asp Gln Ile Val Ser Trp Ser Ala Asn Asn Asn
        35                  40                  45

Ser Phe Ile Val Trp Asn His Ala Glu Phe Ser Arg Leu Leu Leu Pro
    50                  55                  60

Thr Tyr Phe Lys His Asn Asn Phe Ser Ser Phe Ile Arg Gln Leu Asn
65                  70                  75                  80
```

Thr Tyr Gly Phe Arg Lys Ile Asp Pro Glu Arg Trp Glu Phe Leu Asn
85 90 95

Asp Asp Phe Ile Lys Asp Gln Lys His Leu Leu Lys Asn Ile His Arg
100 105 110

Arg Lys Pro Ile His Ser His Ser His Pro Pro Ala Ser Ser Thr Asp
115 120 125

Gln Glu Arg Ala Val Leu Gln Glu Gln Met Asp Lys Leu Ser Arg Glu
130 135 140

Lys Ala Ala Ile Glu Ala Lys Leu Leu Lys Phe Lys Gln Gln Lys Val
145 150 155 160

Val Ala Lys His Gln Phe Glu Glu Met Thr Glu His Val Asp Asp Met
165 170 175

Glu Asn Arg Gln Lys Lys Leu Leu Asn Phe Leu Glu Thr Ala Ile Arg
180 185 190

Asn Pro Thr Phe Val Lys Asn Phe Gly Lys Lys Val Glu Gln Leu Asp
195 200 205

Ile Ser Ala Tyr Asn Lys Lys Arg Arg Leu Pro Glu Val Glu Gln Ser
210 215 220

Lys Pro Pro Ser Glu Asp Ser His Leu Asp Asn Ser Ser Gly Ser Ser
225 230 235 240

Arg Arg Glu Ser Gly Asn Ile Phe His Gln Asn Phe Ser Asn Lys Leu
245 250 255

Arg Leu Glu Leu Ser Pro Ala Asp Ser Asp Met Asn Met Val Ser His
260 265 270

Ser Ile Gln Ser Ser Asn Glu Glu Gly Ala Ser Pro Lys Gly Ile Leu
275 280 285

Ser Gly Gly Asp Pro Asn Thr Thr Leu Thr Lys Arg Glu Gly Leu Pro
290 295 300

Phe Ala Pro Glu Ala Leu Glu Leu Ala Asp Thr Gly Thr Cys Pro Arg

305 310 315 320

Arg Leu Leu Leu Asn Asp Asn Thr Arg Val Glu Thr Leu Gln Gln Arg
325 330 335

Leu Thr Ser Ser Glu Glu Thr Asp Gly Ser Phe Ser Cys His Leu Asn
340 345 350

Leu Thr Leu Ala Ser Ala Pro Leu Pro Asp Lys Thr Ala Ser Gln Ile
355 360 365

Ala Lys Thr Thr Leu Lys Ser Gln Glu Leu Asn Phe Asn Ser Ile Glu
370 375 380

Thr Ser Ala Ser Glu Lys Asn Arg Gly Arg Gln Glu Ile Ala Val Gly
385 390 395 400

Gly Ser Gln Ala Asn Ala Ala Pro Pro Ala Arg Val Asn Asp Val Phe
405 410 415

Trp Glu Gln Phe Leu Thr Glu Arg Pro Gly Ser Ser Asp Asn Glu Glu
420 425 430

Ala Ser Ser Thr Tyr Arg Gly Asn Pro Tyr Glu Glu Gln Glu Glu Lys
435 440 445

Arg Asn Gly Ser Met Met Leu Arg Asn Thr Lys Asn Ile Glu Gln Leu
450 455 460

Thr Leu
465

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<222> (93)..(1874) <223> G278

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atttgtgaat ttcaattcat cggaacctgt tg atg gac acc acc att gat gga 113
Met Asp Thr Thr Ile Asp Gly
1 5

ttc gcc gat tct tat gaa atc agc agc act agt ttc gtc gct acc gat 161
Phe Ala Asp Ser Tyr Glu Ile Ser Ser Thr Ser Phe Val Ala Thr Asp
10 15 20

```
aac acc gac tcc tct att gtt tat ctg gcc gcc gaa caa gta ctc acc      209
Asn Thr Asp Ser Ser Ile Val Tyr Leu Ala Ala Glu Gln Val Leu Thr
    25                  30                  35

gga cct gat gta tct gct ctg caa ttg ctc tcc aac agc ttc gaa tcc      257
Gly Pro Asp Val Ser Ala Leu Gln Leu Leu Ser Asn Ser Phe Glu Ser
40                  45                  50                  55

gtc ttt gac tcg ccg gat gat ttc tac agc gac gct aag ctt gtt ctc      305
Val Phe Asp Ser Pro Asp Asp Phe Tyr Ser Asp Ala Lys Leu Val Leu
                60                  65                  70

tcc gac ggc cgg gaa gtt tct ttc cac cgg tgc gtt ttg tca gcg aga      353
Ser Asp Gly Arg Glu Val Ser Phe His Arg Cys Val Leu Ser Ala Arg
            75                  80                  85

agc tct ttc ttc aag agc gct tta gcc gcc gct aag aag gag aaa gac      401
Ser Ser Phe Phe Lys Ser Ala Leu Ala Ala Ala Lys Lys Glu Lys Asp
        90                  95                  100

tcc aac aac acc gcc gcc gtg aag ctc gag ctt aag gag att gcc aag      449
Ser Asn Asn Thr Ala Ala Val Lys Leu Glu Leu Lys Glu Ile Ala Lys
    105                 110                 115

gat tac gaa gtc ggt ttc gat tcg gtt gtg act gtt ttg gct tat gtt      497
Asp Tyr Glu Val Gly Phe Asp Ser Val Val Thr Val Leu Ala Tyr Val
120                 125                 130                 135

tac agc agc aga gtg aga ccg ccg cct aaa gga gtt tct gaa tgc gca      545
Tyr Ser Ser Arg Val Arg Pro Pro Pro Lys Gly Val Ser Glu Cys Ala
                140                 145                 150

gac gag aat tgc tgc cac gtg gct tgc cgg ccg gcg gtg gat ttc atg      593
Asp Glu Asn Cys Cys His Val Ala Cys Arg Pro Ala Val Asp Phe Met
            155                 160                 165

ttg gag gtt ctc tat ttg gct ttc atc ttc aag atc cct gaa tta att      641
Leu Glu Val Leu Tyr Leu Ala Phe Ile Phe Lys Ile Pro Glu Leu Ile
        170                 175                 180

act ctc tat cag agg cac tta ttg gac gtt gta gac aaa gtt gtt ata      689
Thr Leu Tyr Gln Arg His Leu Leu Asp Val Val Asp Lys Val Val Ile
    185                 190                 195

gag gac aca ttg gtt ata ctc aag ctt gct aat ata tgt ggt aaa gct      737
Glu Asp Thr Leu Val Ile Leu Lys Leu Ala Asn Ile Cys Gly Lys Ala
200                 205                 210                 215

tgt atg aag cta ttg gat aga tgt aaa gag att att gtc aag tct aat      785
Cys Met Lys Leu Leu Asp Arg Cys Lys Glu Ile Ile Val Lys Ser Asn
                220                 225                 230

gta gat atg gtt agt ctt gaa aag tca ttg ccg gaa gag ctt gtt aaa      833
Val Asp Met Val Ser Leu Glu Lys Ser Leu Pro Glu Glu Leu Val Lys
            235                 240                 245

gag ata att gat aga cgt aaa gag ctt ggt ttg gag gta cct aaa gta      881
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```
Glu Ile Ile Asp Arg Arg Lys Glu Leu Gly Leu Glu Val Pro Lys Val
        250                 255                 260

aag aaa cat gtc tcg aat gta cat aag gca ctt gac tcg gat gat att      929
Lys Lys His Val Ser Asn Val His Lys Ala Leu Asp Ser Asp Asp Ile
    265                 270                 275

gag tta gtc aag ttg ctt ttg aaa gag gat cac acc aat cta gat gat      977
Glu Leu Val Lys Leu Leu Leu Lys Glu Asp His Thr Asn Leu Asp Asp
280                 285                 290                 295

gcg tgt gct ctt cat ttc gct gtt gca tat tgc aat gtg aag acc gca     1025
Ala Cys Ala Leu His Phe Ala Val Ala Tyr Cys Asn Val Lys Thr Ala
                300                 305                 310

aca gat ctt tta aaa ctt gat ctt gcc gat gtc aac cat agg aat ccg     1073
Thr Asp Leu Leu Lys Leu Asp Leu Ala Asp Val Asn His Arg Asn Pro
            315                 320                 325

agg gga tat acg gtg ctt cat gtt gct gcg atg cgg aag gag cca caa     1121
Arg Gly Tyr Thr Val Leu His Val Ala Ala Met Arg Lys Glu Pro Gln
        330                 335                 340

ttg ata cta tct cta ttg gaa aaa ggt gca agt gca tca gaa gca act     1169
Leu Ile Leu Ser Leu Leu Glu Lys Gly Ala Ser Ala Ser Glu Ala Thr
    345                 350                 355

ttg gaa ggt aga acc gca ctc atg atc gca aaa caa gcc act atg gcg     1217
Leu Glu Gly Arg Thr Ala Leu Met Ile Ala Lys Gln Ala Thr Met Ala
360                 365                 370                 375

gtt gaa tgt aat aat atc ccg gag caa tgc aag cat tct ctc aaa ggc     1265
Val Glu Cys Asn Asn Ile Pro Glu Gln Cys Lys His Ser Leu Lys Gly
                380                 385                 390

cga cta tgt gta gaa ata cta gag caa gaa gac aaa cga gaa caa att     1313
Arg Leu Cys Val Glu Ile Leu Glu Gln Glu Asp Lys Arg Glu Gln Ile
            395                 400                 405

cct aga gat gtt cct ccc tct ttt gca gtg gcg gcc gat gaa ttg aag     1361
Pro Arg Asp Val Pro Pro Ser Phe Ala Val Ala Ala Asp Glu Leu Lys
        410                 415                 420

atg acg ctg ctc gat ctt gaa aat aga gtt gca ctt gct caa cgt ctt     1409
Met Thr Leu Leu Asp Leu Glu Asn Arg Val Ala Leu Ala Gln Arg Leu
    425                 430                 435

ttt cca acg gaa gca caa gct gca atg gag atc gcc gaa atg aag gga     1457
Phe Pro Thr Glu Ala Gln Ala Ala Met Glu Ile Ala Glu Met Lys Gly
440                 445                 450                 455

aca tgt gag ttc ata gtg act agc ctc gag cct gac cgt ctc act ggt     1505
Thr Cys Glu Phe Ile Val Thr Ser Leu Glu Pro Asp Arg Leu Thr Gly
                460                 465                 470

acg aag aga aca tca ccg ggt gta aag ata gca cct ttc aga atc cta     1553
Thr Lys Arg Thr Ser Pro Gly Val Lys Ile Ala Pro Phe Arg Ile Leu
```

Replacement Sheet

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            475                 480                 485

gaa gag cat caa agt aga cta aaa gcg ctt tct aaa acc gtg gaa ctc     1601
Glu Glu His Gln Ser Arg Leu Lys Ala Leu Ser Lys Thr Val Glu Leu
        490                 495                 500

ggg aaa cga ttc ttc ccg cgc tgt tcg gca gtg ctc gac cag att atg     1649
Gly Lys Arg Phe Phe Pro Arg Cys Ser Ala Val Leu Asp Gln Ile Met
    505                 510                 515

aac tgt gag gac ttg act caa ctg gct tgc gga gaa gac gac act gct     1697
Asn Cys Glu Asp Leu Thr Gln Leu Ala Cys Gly Glu Asp Asp Thr Ala
520                 525                 530                 535

gag aaa cga cta caa aag aag caa agg tac atg gaa ata caa gag aca     1745
Glu Lys Arg Leu Gln Lys Lys Gln Arg Tyr Met Glu Ile Gln Glu Thr
                540                 545                 550

cta aag aag gcc ttt agt gag gac aat ttg gaa tta gga aat tcg tcc     1793
Leu Lys Lys Ala Phe Ser Glu Asp Asn Leu Glu Leu Gly Asn Ser Ser
            555                 560                 565

ctg aca gat tcg act tct tcc aca tcg aaa tca acc ggt gga aag agg     1841
Leu Thr Asp Ser Thr Ser Ser Thr Ser Lys Ser Thr Gly Gly Lys Arg
        570                 575                 580

tct aac cgt aaa ctc tct cat cgt cgt cgg tga gactcttgcc tcttagtgta   1894
Ser Asn Arg Lys Leu Ser His Arg Arg Arg
    585                 590

atttttgctg taccatataa ttctgttttc atgatgactg taactgttta tgtctatcgt   1954

tggcgtcata tagtttcgct cttcgttttg catcctgtgt attattgctg caggtgtgct   2014

tcaaacaaat gttgtaacaa tttgaaccaa tggtatacag atttgtaata tatatttatg   2074

tacatcaaca ataaaaaaaa aaaaaaaaaa                                    2104
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<210> 74 <211> 593 <212> PRT <213> Arabidopsis thaliana <400> 74

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Met Asp Thr Thr Ile Asp Gly Phe Ala Asp Ser Tyr Glu Ile Ser Ser
1               5                   10                  15

Thr Ser Phe Val Ala Thr Asp Asn Thr Asp Ser Ser Ile Val Tyr Leu
            20                  25                  30

Ala Ala Glu Gln Val Leu Thr Gly Pro Asp Val Ser Ala Leu Gln Leu
        35                  40                  45

Leu Ser Asn Ser Phe Glu Ser Val Phe Asp Ser Pro Asp Asp Phe Tyr
    50                  55                  60
```

Ser Asp Ala Lys Leu Val Leu Ser Asp Gly Arg Glu Val Ser Phe His
65 70 75 80

Arg Cys Val Leu Ser Ala Arg Ser Ser Phe Phe Lys Ser Ala Leu Ala
85 90 95

Ala Ala Lys Lys Glu Lys Asp Ser Asn Asn Thr Ala Ala Val Lys Leu
100 105 110

Glu Leu Lys Glu Ile Ala Lys Asp Tyr Glu Val Gly Phe Asp Ser Val
115 120 125

Val Thr Val Leu Ala Tyr Val Tyr Ser Ser Arg Val Arg Pro Pro Pro
130 135 140

Lys Gly Val Ser Glu Cys Ala Asp Glu Asn Cys Cys His Val Ala Cys
145 150 155 160

Arg Pro Ala Val Asp Phe Met Leu Glu Val Leu Tyr Leu Ala Phe Ile
165 170 175

Phe Lys Ile Pro Glu Leu Ile Thr Leu Tyr Gln Arg His Leu Leu Asp
180 185 190

Val Val Asp Lys Val Val Ile Glu Asp Thr Leu Val Ile Leu Lys Leu
195 200 205

Ala Asn Ile Cys Gly Lys Ala Cys Met Lys Leu Leu Asp Arg Cys Lys
210 215 220

Glu Ile Ile Val Lys Ser Asn Val Asp Met Val Ser Leu Glu Lys Ser
225 230 235 240

Leu Pro Glu Glu Leu Val Lys Glu Ile Ile Asp Arg Arg Lys Glu Leu
245 250 255

Gly Leu Glu Val Pro Lys Val Lys Lys His Val Ser Asn Val His Lys
260 265 270

Ala Leu Asp Ser Asp Asp Ile Glu Leu Val Lys Leu Leu Leu Lys Glu
275 280 285

Asp His Thr Asn Leu Asp Asp Ala Cys Ala Leu His Phe Ala Val Ala

290 295 300

Tyr Cys Asn Val Lys Thr Ala Thr Asp Leu Leu Lys Leu Asp Leu Ala
305 310 315 320

Asp Val Asn His Arg Asn Pro Arg Gly Tyr Thr Val Leu His Val Ala
325 330 335

Ala Met Arg Lys Glu Pro Gln Leu Ile Leu Ser Leu Leu Glu Lys Gly
340 345 350

Ala Ser Ala Ser Glu Ala Thr Leu Glu Gly Arg Thr Ala Leu Met Ile
355 360 365

Ala Lys Gln Ala Thr Met Ala Val Glu Cys Asn Asn Ile Pro Glu Gln
370 375 380

Cys Lys His Ser Leu Lys Gly Arg Leu Cys Val Glu Ile Leu Glu Gln
385 390 395 400

Glu Asp Lys Arg Glu Gln Ile Pro Arg Asp Val Pro Pro Ser Phe Ala
405 410 415

Val Ala Ala Asp Glu Leu Lys Met Thr Leu Leu Asp Leu Glu Asn Arg
420 425 430

Val Ala Leu Ala Gln Arg Leu Phe Pro Thr Glu Ala Gln Ala Ala Met
435 440 445

Glu Ile Ala Glu Met Lys Gly Thr Cys Glu Phe Ile Val Thr Ser Leu
450 455 460

Glu Pro Asp Arg Leu Thr Gly Thr Lys Arg Thr Ser Pro Gly Val Lys
465 470 475 480

Ile Ala Pro Phe Arg Ile Leu Glu Glu His Gln Ser Arg Leu Lys Ala
485 490 495

Leu Ser Lys Thr Val Glu Leu Gly Lys Arg Phe Phe Pro Arg Cys Ser
500 505 510

Ala Val Leu Asp Gln Ile Met Asn Cys Glu Asp Leu Thr Gln Leu Ala
515 520 525

```
Cys Gly Glu Asp Asp Thr Ala Glu Lys Arg Leu Gln Lys Lys Gln Arg
    530                 535                 540

Tyr Met Glu Ile Gln Glu Thr Leu Lys Lys Ala Phe Ser Glu Asp Asn
545                 550                 555                 560

Leu Glu Leu Gly Asn Ser Ser Leu Thr Asp Ser Thr Ser Ser Thr Ser
                565                 570                 575

Lys Ser Thr Gly Gly Lys Arg Ser Asn Arg Lys Leu Ser His Arg Arg
            580                 585                 590

Arg
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<210> 75 <211> 1350 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (124)..(1197) <223> G291

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tcaaatcaat tctcgcgatt aagcaaaacc ctagatttat tctactcttc gaagtcgatt    120

tca atg gaa ggt tcc tcg tca gcc atc gcg agg aag aca tgg gag cta      168
    Met Glu Gly Ser Ser Ser Ala Ile Ala Arg Lys Thr Trp Glu Leu
    1               5                   10                  15

gag aac aac att ctc cca gtg gaa cca acc gat tca gcc tcc gac agt      216
Glu Asn Asn Ile Leu Pro Val Glu Pro Thr Asp Ser Ala Ser Asp Ser
                20                  25                  30

ata ttc cac tac gac gac gct tca caa gcc aaa atc cag cag gag aag      264
Ile Phe His Tyr Asp Asp Ala Ser Gln Ala Lys Ile Gln Gln Glu Lys
            35                  40                  45

cca tgg gcc tcc gat cct aac tac ttc aag cgc gtt cac atc tca gcc      312
Pro Trp Ala Ser Asp Pro Asn Tyr Phe Lys Arg Val His Ile Ser Ala
        50                  55                  60

ctt gct ctt ctc aag atg gtg gtt cac gct cgc tcc ggt ggc aca atc      360
Leu Ala Leu Leu Lys Met Val Val His Ala Arg Ser Gly Gly Thr Ile
    65                  70                  75

gag atc atg ggt ctt atg cag ggt aaa acc gag ggt gat aca atc atc      408
Glu Ile Met Gly Leu Met Gln Gly Lys Thr Glu Gly Asp Thr Ile Ile
80                  85                  90                  95

gtt atg gat gct ttt gct ttg cct gtt gaa ggt act gag act agg gtt      456
Val Met Asp Ala Phe Ala Leu Pro Val Glu Gly Thr Glu Thr Arg Val
                100                 105                 110
```

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aat gct cag tct gat gcc tat gag tat atg gtt gaa tac tct cag acc      504
Asn Ala Gln Ser Asp Ala Tyr Glu Tyr Met Val Glu Tyr Ser Gln Thr
            115                 120                 125

agc aag ctg gct ggg agg ttg gag aac gtt gtt gga tgg tat cac tct      552
Ser Lys Leu Ala Gly Arg Leu Glu Asn Val Val Gly Trp Tyr His Ser
        130                 135                 140

cac cct ggg tat gga tgt tgg ctc tcg ggt att gat gtt tcg aca cag      600
His Pro Gly Tyr Gly Cys Trp Leu Ser Gly Ile Asp Val Ser Thr Gln
    145                 150                 155

atg ctt aac caa cag tat cag gag cca ttc tta gct gtt gtt att gat      648
Met Leu Asn Gln Gln Tyr Gln Glu Pro Phe Leu Ala Val Val Ile Asp
160                 165                 170                 175

cca aca agg act gtt tcg gct ggt aag gtt gag att ggg gca ttc aga      696
Pro Thr Arg Thr Val Ser Ala Gly Lys Val Glu Ile Gly Ala Phe Arg
                180                 185                 190

aca tat cca gag gga cat aag atc tcg gat gat cat gtt tct gag tat      744
Thr Tyr Pro Glu Gly His Lys Ile Ser Asp Asp His Val Ser Glu Tyr
            195                 200                 205

cag act atc cct ctt aac aag att gag gac ttt ggt gta cat tgc aaa      792
Gln Thr Ile Pro Leu Asn Lys Ile Glu Asp Phe Gly Val His Cys Lys
        210                 215                 220

cag tac tac tca ttg gac atc act tat ttc aag tca tct ctc gat agt      840
Gln Tyr Tyr Ser Leu Asp Ile Thr Tyr Phe Lys Ser Ser Leu Asp Ser
    225                 230                 235

cac ctt ctg gat ctc ctt tgg aac aag tac tgg gtg aac act ctt tct      888
His Leu Leu Asp Leu Leu Trp Asn Lys Tyr Trp Val Asn Thr Leu Ser
240                 245                 250                 255

tct tcc cca ctg ttg ggc aat gga gac tat gtt gcc ggg caa ata tca      936
Ser Ser Pro Leu Leu Gly Asn Gly Asp Tyr Val Ala Gly Gln Ile Ser
                260                 265                 270

gac ttg gct gag aag ctc gag caa gcg gag agt cag ctc gct aac tcc      984
Asp Leu Ala Glu Lys Leu Glu Gln Ala Glu Ser Gln Leu Ala Asn Ser
            275                 280                 285

cgg tat gga gga att gcg cca gcc ggt cac caa agg agg aaa gag gat     1032
Arg Tyr Gly Gly Ile Ala Pro Ala Gly His Gln Arg Arg Lys Glu Asp
        290                 295                 300

gag cct caa ctc gcg aag ata act cgg gat agt gca aag ata act gtc     1080
Glu Pro Gln Leu Ala Lys Ile Thr Arg Asp Ser Ala Lys Ile Thr Val
    305                 310                 315

gag cag gtc cat gga cta atg tca cag gtt atc aaa gac atc ttg ttc     1128
Glu Gln Val His Gly Leu Met Ser Gln Val Ile Lys Asp Ile Leu Phe
320                 325                 330                 335
```

aat tcc gct cgt cag tcc aag aag tct gct gac gac tca tca gat cca 1176
Asn Ser Ala Arg Gln Ser Lys Lys Ser Ala Asp Asp Ser Ser Asp Pro
340 345 350

gag ccc atg att aca tcg tga agttggtcta ttcttttgtt ttttggctgc 1227
Glu Pro Met Ile Thr Ser
355

ggaaattgac tatcggtttg acccggttta tgaggcaatg cccattgttc cctatatctc 1287

tagtgtagta tctgcttcag acaaagatct ttgggttatt aaatgacatt aacataaaaa 1347

aaa 1350

<210> 76 <211> 357 <212> PRT <213> Arabidopsis thaliana <400> 76

Met Glu Gly Ser Ser Ser Ala Ile Ala Arg Lys Thr Trp Glu Leu Glu
1 5 10 15

Asn Asn Ile Leu Pro Val Glu Pro Thr Asp Ser Ala Ser Asp Ser Ile
20 25 30

Phe His Tyr Asp Asp Ala Ser Gln Ala Lys Ile Gln Gln Glu Lys Pro
35 40 45

Trp Ala Ser Asp Pro Asn Tyr Phe Lys Arg Val His Ile Ser Ala Leu
50 55 60

Ala Leu Leu Lys Met Val Val His Ala Arg Ser Gly Gly Thr Ile Glu
65 70 75 80

Ile Met Gly Leu Met Gln Gly Lys Thr Glu Gly Asp Thr Ile Ile Val
85 90 95

Met Asp Ala Phe Ala Leu Pro Val Glu Gly Thr Glu Thr Arg Val Asn
100 105 110

Ala Gln Ser Asp Ala Tyr Glu Tyr Met Val Glu Tyr Ser Gln Thr Ser
115 120 125

Lys Leu Ala Gly Arg Leu Glu Asn Val Val Gly Trp Tyr His Ser His
130 135 140

Pro Gly Tyr Gly Cys Trp Leu Ser Gly Ile Asp Val Ser Thr Gln Met
145 150 155 160

Leu Asn Gln Gln Tyr Gln Glu Pro Phe Leu Ala Val Val Ile Asp Pro
165 170 175

Thr Arg Thr Val Ser Ala Gly Lys Val Glu Ile Gly Ala Phe Arg Thr
180 185 190

Tyr Pro Glu Gly His Lys Ile Ser Asp Asp His Val Ser Glu Tyr Gln
195 200 205

Thr Ile Pro Leu Asn Lys Ile Glu Asp Phe Gly Val His Cys Lys Gln
210 215 220

Tyr Tyr Ser Leu Asp Ile Thr Tyr Phe Lys Ser Ser Leu Asp Ser His
225 230 235 240

Leu Leu Asp Leu Leu Trp Asn Lys Tyr Trp Val Asn Thr Leu Ser Ser
245 250 255

Ser Pro Leu Leu Gly Asn Gly Asp Tyr Val Ala Gly Gln Ile Ser Asp
260 265 270

Leu Ala Glu Lys Leu Glu Gln Ala Glu Ser Gln Leu Ala Asn Ser Arg
275 280 285

Tyr Gly Gly Ile Ala Pro Ala Gly His Gln Arg Arg Lys Glu Asp Glu
290 295 300

Pro Gln Leu Ala Lys Ile Thr Arg Asp Ser Ala Lys Ile Thr Val Glu
305 310 315 320

Gln Val His Gly Leu Met Ser Gln Val Ile Lys Asp Ile Leu Phe Asn
325 330 335

Ser Ala Arg Gln Ser Lys Lys Ser Ala Asp Asp Ser Ser Asp Pro Glu
340 345 350

Pro Met Ile Thr Ser
355

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<222> (1)..(795) <223> G343

<400> 77
atg gac gtc tat ggc tta tct tca cca gac tta ctt cga atc gac gac 48

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Met Asp Val Tyr Gly Leu Ser Ser Pro Asp Leu Leu Arg Ile Asp Asp
1               5                  10                  15

ctt ctt gat ttc tcc aac gaa gac atc ttc tcc gct tct tct tcc ggt      96
Leu Leu Asp Phe Ser Asn Glu Asp Ile Phe Ser Ala Ser Ser Ser Gly
            20                  25                  30

ggt tcc acc gcc gct act tcc tct tct tct ttc cct cct cct caa aac      144
Gly Ser Thr Ala Ala Thr Ser Ser Ser Ser Phe Pro Pro Pro Gln Asn
        35                  40                  45

cct agt ttc cac cac cac cat ctc cct tcc tcc gcc gat cat cac tcc      192
Pro Ser Phe His His His His Leu Pro Ser Ser Ala Asp His His Ser
    50                  55                  60

ttc ctc cac gac att tgc gtt ccc agt gat gac gca gct cat ctt gaa      240
Phe Leu His Asp Ile Cys Val Pro Ser Asp Asp Ala Ala His Leu Glu
65                  70                  75                  80

tgg ctt tcg caa ttc gtg gac gat tct ttc gct gat ttt ccg gcg aat      288
Trp Leu Ser Gln Phe Val Asp Asp Ser Phe Ala Asp Phe Pro Ala Asn
                85                  90                  95

cca tta gga gga act atg act tct gtc aaa act gaa act tcc ttt ccg      336
Pro Leu Gly Gly Thr Met Thr Ser Val Lys Thr Glu Thr Ser Phe Pro
            100                 105                 110

ggg aaa cca aga agc aaa cga tca aga gct cct gct cct ttc gcc gga      384
Gly Lys Pro Arg Ser Lys Arg Ser Arg Ala Pro Ala Pro Phe Ala Gly
        115                 120                 125

aca tgg tct ccg atg cca ctg gaa tcc gag cat cag cag ctt cac tcc      432
Thr Trp Ser Pro Met Pro Leu Glu Ser Glu His Gln Gln Leu His Ser
    130                 135                 140

gcc gcc aaa ttc aag cca aag aaa gaa caa tcc ggc gga gga gga gga      480
Ala Ala Lys Phe Lys Pro Lys Lys Glu Gln Ser Gly Gly Gly Gly Gly
145                 150                 155                 160

gga gga gga aga cat cag tca tcg tca tcg gag act acg gaa gga gga      528
Gly Gly Gly Arg His Gln Ser Ser Ser Ser Glu Thr Thr Glu Gly Gly
                165                 170                 175

gga atg agg aga tgt act cac tgt gca tcg gag aaa acg cca cag tgg      576
Gly Met Arg Arg Cys Thr His Cys Ala Ser Glu Lys Thr Pro Gln Trp
            180                 185                 190

agg aca gga cca ctt gga cct aaa aca cta tgt aac gct tgt gga gtc      624
Arg Thr Gly Pro Leu Gly Pro Lys Thr Leu Cys Asn Ala Cys Gly Val
        195                 200                 205

cgg ttt aaa tcc ggt aga ctt gta ccg gaa tat aga ccg gct tcg agt      672
Arg Phe Lys Ser Gly Arg Leu Val Pro Glu Tyr Arg Pro Ala Ser Ser
    210                 215                 220

cct act ttt gtt ttg act cag cat tca aac tct cac cgg aaa gtg atg      720
Pro Thr Phe Val Leu Thr Gln His Ser Asn Ser His Arg Lys Val Met
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225 230 235 240

gag ctt cga cgg cag aaa gaa gtt atg aga caa cca caa caa gtt caa 768
Glu Leu Arg Arg Gln Lys Glu Val Met Arg Gln Pro Gln Gln Val Gln
245 250 255

ctt cat cac cac cac cac ccg ttt tag 795
Leu His His His His His Pro Phe
260

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Met Asp Val Tyr Gly Leu Ser Ser Pro Asp Leu Leu Arg Ile Asp Asp
1 5 10 15

Leu Leu Asp Phe Ser Asn Glu Asp Ile Phe Ser Ala Ser Ser Ser Gly
20 25 30

Gly Ser Thr Ala Ala Thr Ser Ser Ser Ser Phe Pro Pro Pro Gln Asn
35 40 45

Pro Ser Phe His His His His Leu Pro Ser Ser Ala Asp His His Ser
50 55 60

Phe Leu His Asp Ile Cys Val Pro Ser Asp Asp Ala Ala His Leu Glu
65 70 75 80

Trp Leu Ser Gln Phe Val Asp Asp Ser Phe Ala Asp Phe Pro Ala Asn
85 90 95

Pro Leu Gly Gly Thr Met Thr Ser Val Lys Thr Glu Thr Ser Phe Pro
100 105 110

Gly Lys Pro Arg Ser Lys Arg Ser Arg Ala Pro Ala Pro Phe Ala Gly
115 120 125

Thr Trp Ser Pro Met Pro Leu Glu Ser Glu His Gln Gln Leu His Ser
130 135 140

Ala Ala Lys Phe Lys Pro Lys Lys Glu Gln Ser Gly Gly Gly Gly Gly
145 150 155 160

Gly Gly Gly Arg His Gln Ser Ser Ser Ser Glu Thr Thr Glu Gly Gly
165 170 175

Gly Met Arg Arg Cys Thr His Cys Ala Ser Glu Lys Thr Pro Gln Trp
180 185 190

Arg Thr Gly Pro Leu Gly Pro Lys Thr Leu Cys Asn Ala Cys Gly Val
195 200 205

Arg Phe Lys Ser Gly Arg Leu Val Pro Glu Tyr Arg Pro Ala Ser Ser
210 215 220

Pro Thr Phe Val Leu Thr Gln His Ser Asn Ser His Arg Lys Val Met
225 230 235 240

Glu Leu Arg Arg Gln Lys Glu Val Met Arg Gln Pro Gln Gln Val Gln
245 250 255

Leu His His His His His Pro Phe
260

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<222> (82)..(570) <223> G353

<400> 79
accaaactca aaaaacacaa accacaagag gatcatttca ttttttattg tttcgtttta 60

atcatcatca tcagaagaaa a atg gtt gcg ata tcg gag atc aag tcg acg 111
Met Val Ala Ile Ser Glu Ile Lys Ser Thr
1 5 10

gtg gat gtc acg gcg gcg aat tgt ttg atg ctt tta tct aga gtt gga 159
Val Asp Val Thr Ala Ala Asn Cys Leu Met Leu Leu Ser Arg Val Gly
15 20 25

caa gaa aac gtt gac ggt ggc gat caa aaa cgc gtt ttc aca tgt aaa 207
Gln Glu Asn Val Asp Gly Gly Asp Gln Lys Arg Val Phe Thr Cys Lys
30 35 40

acg tgt ttg aag cag ttt cat tcg ttc caa gcc tta gga ggt cac cgt 255
Thr Cys Leu Lys Gln Phe His Ser Phe Gln Ala Leu Gly Gly His Arg
45 50 55

gcg agt cac aag aag cct aac aac gac gct ttg tcg tct gga ttg atg 303
Ala Ser His Lys Lys Pro Asn Asn Asp Ala Leu Ser Ser Gly Leu Met
60 65 70

aag aag gtg aaa acg tcg tcg cat cct tgt ccc ata tgt gga gtg gag 351
Lys Lys Val Lys Thr Ser Ser His Pro Cys Pro Ile Cys Gly Val Glu
75 80 85 90

ttt ccg atg gga caa gct ttg gga gga cac atg agg aga cac agg aac 399
Phe Pro Met Gly Gln Ala Leu Gly Gly His Met Arg Arg His Arg Asn
95 100 105

gag agt ggg gct gct ggt ggc gcg ttg gtt aca cgc gct ttg ttg ccg 447
Glu Ser Gly Ala Ala Gly Gly Ala Leu Val Thr Arg Ala Leu Leu Pro
110 115 120

gag ccc acg gtg act acg ttg aag aaa tct agc agt ggg aag aga gtg 495
Glu Pro Thr Val Thr Thr Leu Lys Lys Ser Ser Ser Gly Lys Arg Val
125 130 135

gct tgt ttg gat ctg agt cta ggg atg gtg gac aat ttg aat ctc aag 543
Ala Cys Leu Asp Leu Ser Leu Gly Met Val Asp Asn Leu Asn Leu Lys
140 145 150

ttg gag ctt gga aga aca gtt tat tga ttttatttat tttccttaaa 590
Leu Glu Leu Gly Arg Thr Val Tyr
155 160

ttttctgaat atatttgttt ctctcattct ttgaattttt cttaatattc tagattatac 650

atacatccgc agatttagga aactttcata gagtgtaatc ttttctttct gtaaaaatat 710

attttacttg tagcaaa 727

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Met Val Ala Ile Ser Glu Ile Lys Ser Thr Val Asp Val Thr Ala Ala
1 5 10 15

Asn Cys Leu Met Leu Leu Ser Arg Val Gly Gln Glu Asn Val Asp Gly
20 25 30

Gly Asp Gln Lys Arg Val Phe Thr Cys Lys Thr Cys Leu Lys Gln Phe
35 40 45

His Ser Phe Gln Ala Leu Gly Gly His Arg Ala Ser His Lys Lys Pro
50 55 60

Asn Asn Asp Ala Leu Ser Ser Gly Leu Met Lys Lys Val Lys Thr Ser
65 70 75 80

Ser His Pro Cys Pro Ile Cys Gly Val Glu Phe Pro Met Gly Gln Ala
85 90 95

Leu Gly Gly His Met Arg Arg His Arg Asn Glu Ser Gly Ala Ala Gly
100 105 110

Gly Ala Leu Val Thr Arg Ala Leu Leu Pro Glu Pro Thr Val Thr Thr
115 120 125

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Leu Lys Lys Ser Ser Ser Gly Lys Arg Val Ala Cys Leu Asp Leu Ser
    130                 135                 140

Leu Gly Met Val Asp Asn Leu Asn Leu Lys Leu Glu Leu Gly Arg Thr
145                 150                 155                 160

Val Tyr
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<400> 81

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                              Met Val Ala Arg Ser Glu Glu Ile Val
                              1               5

ata gtg gaa gaa gat acg act gcg aaa tgt ttg atg ttg tta tca aga      101
Ile Val Glu Glu Asp Thr Thr Ala Lys Cys Leu Met Leu Leu Ser Arg
10                  15                  20                  25

gtc gga gaa tgc ggc ggc ggc tgc ggg gga gat gaa cgt gtt ttc cga      149
Val Gly Glu Cys Gly Gly Gly Cys Gly Gly Asp Glu Arg Val Phe Arg
                30                  35                  40

tgc aag act tgt ctt aaa gag ttc tca tcg ttt caa gct ttg gga ggt      197
Cys Lys Thr Cys Leu Lys Glu Phe Ser Ser Phe Gln Ala Leu Gly Gly
            45                  50                  55

cat cgt gca agc cac aag aaa ctt atc aac agt gac aat cca tca ctt      245
His Arg Ala Ser His Lys Lys Leu Ile Asn Ser Asp Asn Pro Ser Leu
        60                  65                  70

ctt gga tcc ttg tcc aac aag aaa act aaa acg tct cat cct tgt ccg      293
Leu Gly Ser Leu Ser Asn Lys Lys Thr Lys Thr Ser His Pro Cys Pro
    75                  80                  85

ata tgt gga gtg aag ttt ccg atg gga caa gct ctt ggt ggt cac atg      341
Ile Cys Gly Val Lys Phe Pro Met Gly Gln Ala Leu Gly Gly His Met
90                  95                  100                 105

agg aga cat agg aac gag aaa gtc tca ggc tcg ttg gtt aca cgt tct      389
Arg Arg His Arg Asn Glu Lys Val Ser Gly Ser Leu Val Thr Arg Ser
                110                 115                 120

ttt cta ccg gag acg acg acg gtg acg gct ttg aag aaa ttt agt agt      437
Phe Leu Pro Glu Thr Thr Thr Val Thr Ala Leu Lys Lys Phe Ser Ser
            125                 130                 135

ggg aag aga gtg gct tgt ttg gat ttg gac tta gat tcg atg gag agt      485
Gly Lys Arg Val Ala Cys Leu Asp Leu Asp Leu Asp Ser Met Glu Ser
        140                 145                 150
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ttg gtc aat tgg aag ttg gag ttg gga aga acg att tct tgg agt taa 533
Leu Val Asn Trp Lys Leu Glu Leu Gly Arg Thr Ile Ser Trp Ser
155 160 165

gtttttgggt tgtatacagt ttcacatgat tttgtaatct ttgttgatcc aattatcgta 593

ccgatcgatg tgaatattat tttgatacaa taaaa 628

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Met Val Ala Arg Ser Glu Glu Ile Val Ile Val Glu Glu Asp Thr Thr
1 5 10 15

Ala Lys Cys Leu Met Leu Leu Ser Arg Val Gly Glu Cys Gly Gly Gly
20 25 30

Cys Gly Gly Asp Glu Arg Val Phe Arg Cys Lys Thr Cys Leu Lys Glu
35 40 45

Phe Ser Ser Phe Gln Ala Leu Gly Gly His Arg Ala Ser His Lys Lys
50 55 60

Leu Ile Asn Ser Asp Asn Pro Ser Leu Leu Gly Ser Leu Ser Asn Lys
65 70 75 80

Lys Thr Lys Thr Ser His Pro Cys Pro Ile Cys Gly Val Lys Phe Pro
85 90 95

Met Gly Gln Ala Leu Gly Gly His Met Arg Arg His Arg Asn Glu Lys
100 105 110

Val Ser Gly Ser Leu Val Thr Arg Ser Phe Leu Pro Glu Thr Thr Thr
115 120 125

Val Thr Ala Leu Lys Lys Phe Ser Ser Gly Lys Arg Val Ala Cys Leu
130 135 140

Asp Leu Asp Leu Asp Ser Met Glu Ser Leu Val Asn Trp Lys Leu Glu
145 150 155 160

Leu Gly Arg Thr Ile Ser Trp Ser
165

<210> 83 <211> 615 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(615) <223> G357

<400> 83

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atg cag aac aaa cac aaa tgc aag ctc tgt tcc aag agt ttc tgt aat       48
Met Gln Asn Lys His Lys Cys Lys Leu Cys Ser Lys Ser Phe Cys Asn
1               5                   10                  15

ggc aga gca ctt ggt ggt cac atg aag tct cac ttg gtc tca tct cag       96
Gly Arg Ala Leu Gly Gly His Met Lys Ser His Leu Val Ser Ser Gln
            20                  25                  30

tct tca gct cgg aag aaa cta ggt gac tcg gtc tat tct tct tct tcc      144
Ser Ser Ala Arg Lys Lys Leu Gly Asp Ser Val Tyr Ser Ser Ser Ser
        35                  40                  45

tct tcc tcc gat ggt aaa gcg ctc gcc tac ggg tta cga gag aac ccg      192
Ser Ser Ser Asp Gly Lys Ala Leu Ala Tyr Gly Leu Arg Glu Asn Pro
    50                  55                  60

agg aag agt ttc cgg gtc ttt aat ccg gat cct gag tca tcc aca att      240
Arg Lys Ser Phe Arg Val Phe Asn Pro Asp Pro Glu Ser Ser Thr Ile
65                  70                  75                  80

tac aac agt gag aca gag acc gaa cct gaa tcc gga gac ccg gtt aag      288
Tyr Asn Ser Glu Thr Glu Thr Glu Pro Glu Ser Gly Asp Pro Val Lys
                85                  90                  95

aaa cgg gtc aga gga gat gtt tca aag aag aag aag aag aag gca aag      336
Lys Arg Val Arg Gly Asp Val Ser Lys Lys Lys Lys Lys Lys Ala Lys
            100                 105                 110

agt aag aga gtg ttt gag aac tcg aag aag caa aag aca att cac gag      384
Ser Lys Arg Val Phe Glu Asn Ser Lys Lys Gln Lys Thr Ile His Glu
        115                 120                 125

tca cca gaa cca gcg agt tct gtc tct gat ggt tct cct gaa caa gat      432
Ser Pro Glu Pro Ala Ser Ser Val Ser Asp Gly Ser Pro Glu Gln Asp
    130                 135                 140

tta gct atg tgc ttg atg atg ctg tca aga gat tca agg gag ctc gag      480
Leu Ala Met Cys Leu Met Met Leu Ser Arg Asp Ser Arg Glu Leu Glu
145                 150                 155                 160

att aaa ctg aaa aaa ccg gag gaa gag agg aag ccg gaa aaa aga cat      528
Ile Lys Leu Lys Lys Pro Glu Glu Glu Arg Lys Pro Glu Lys Arg His
                165                 170                 175

ttc cct gag ctc cgt cgc tgt atg ata gat ctg aat ctt cct ccg ccg      576
Phe Pro Glu Leu Arg Arg Cys Met Ile Asp Leu Asn Leu Pro Pro Pro
            180                 185                 190

caa gaa gct gaa gct gtc acc gtc gtt tca gcc ata taa                  615
Gln Glu Ala Glu Ala Val Thr Val Val Ser Ala Ile
        195                 200
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<210> 84 <211> 204 <212> PRT <213> Arabidopsis thaliana <400> 84

Met Gln Asn Lys His Lys Cys Lys Leu Cys Ser Lys Ser Phe Cys Asn
1 5 10 15

Gly Arg Ala Leu Gly Gly His Met Lys Ser His Leu Val Ser Ser Gln
20 25 30

Ser Ser Ala Arg Lys Lys Leu Gly Asp Ser Val Tyr Ser Ser Ser Ser
35 40 45

Ser Ser Ser Asp Gly Lys Ala Leu Ala Tyr Gly Leu Arg Glu Asn Pro
50 55 60

Arg Lys Ser Phe Arg Val Phe Asn Pro Asp Pro Glu Ser Ser Thr Ile
65 70 75 80

Tyr Asn Ser Glu Thr Glu Thr Glu Pro Glu Ser Gly Asp Pro Val Lys
85 90 95

Lys Arg Val Arg Gly Asp Val Ser Lys Lys Lys Lys Lys Lys Ala Lys
100 105 110

Ser Lys Arg Val Phe Glu Asn Ser Lys Lys Gln Lys Thr Ile His Glu
115 120 125

Ser Pro Glu Pro Ala Ser Ser Val Ser Asp Gly Ser Pro Glu Gln Asp
130 135 140

Leu Ala Met Cys Leu Met Met Leu Ser Arg Asp Ser Arg Glu Leu Glu
145 150 155 160

Ile Lys Leu Lys Lys Pro Glu Glu Glu Arg Lys Pro Glu Lys Arg His
165 170 175

Phe Pro Glu Leu Arg Arg Cys Met Ile Asp Leu Asn Leu Pro Pro Pro
180 185 190

Gln Glu Ala Glu Ala Val Thr Val Val Ser Ala Ile
195 200

<210> 85 <211> 728 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (64)..(516) <223> G364

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aagcttgata tcgcctctct ctaatctctc tttctctctc tatctctaag aatatataaa 60

ggt atg gac tac cag cca aac aca tcc cta cgt cta agc cta cca agt 108
Met Asp Tyr Gln Pro Asn Thr Ser Leu Arg Leu Ser Leu Pro Ser
1 5 10 15

tac aag aac cac caa cta aac cta gaa ctt gtt ctc gag cct tct tcc 156
Tyr Lys Asn His Gln Leu Asn Leu Glu Leu Val Leu Glu Pro Ser Ser
20 25 30

atg tct tct tct tca tct tct tcc acg aac tca tca tca tgt ttg gag 204
Met Ser Ser Ser Ser Ser Ser Ser Thr Asn Ser Ser Ser Cys Leu Glu
35 40 45

cag cct agg gta ttc tca tgt aac tat tgt caa aga aag ttt tac agc 252
Gln Pro Arg Val Phe Ser Cys Asn Tyr Cys Gln Arg Lys Phe Tyr Ser
50 55 60

tct caa gct ctt ggt ggt cat caa aac gct cat aag ctt gag aga acc 300
Ser Gln Ala Leu Gly Gly His Gln Asn Ala His Lys Leu Glu Arg Thr
65 70 75

tta gcc aag aag agt cga gaa ctc ttt aga tcc tca aac act gtt gat 348
Leu Ala Lys Lys Ser Arg Glu Leu Phe Arg Ser Ser Asn Thr Val Asp
80 85 90 95

tct gat cag cct tac ccg ttc tcc ggt cgc ttt gag ctt tac ggc cgt 396
Ser Asp Gln Pro Tyr Pro Phe Ser Gly Arg Phe Glu Leu Tyr Gly Arg
100 105 110

ggc tac caa gga ttt ctc gaa agt ggc ggc tcg agg gac ttc tcc gcc 444
Gly Tyr Gln Gly Phe Leu Glu Ser Gly Gly Ser Arg Asp Phe Ser Ala
115 120 125

cgc cgt gtg ccg gag agt ggt ctt gat cag gat cag gag aag agt cac 492
Arg Arg Val Pro Glu Ser Gly Leu Asp Gln Asp Gln Glu Lys Ser His
130 135 140

ctt gac tta tcc tta agg ctc taa aagaatctta tattttgtta gtctatatat 546
Leu Asp Leu Ser Leu Arg Leu
145 150

tatcatatca attgttaatc ttaaaattga ttgttttact tattagtcat ttcctattat 606

ctgaaagttt tctttgtaag ttgtaactat ggtcctaaat tcaaatccaa atttgatttt 666

ggaagatggt acctaatgca gtagttaaat aagttaaaaa aatgaaggat ctataattct 726

ct 728

<210> 86 <211> 150 <212> PRT <213> Arabidopsis thaliana <400> 86

Met Asp Tyr Gln Pro Asn Thr Ser Leu Arg Leu Ser Leu Pro Ser Tyr
1 5 10 15

Lys Asn His Gln Leu Asn Leu Glu Leu Val Leu Glu Pro Ser Ser Met

20 25 30

Ser Ser Ser Ser Ser Ser Ser Thr Asn Ser Ser Ser Cys Leu Glu Gln
35 40 45

Pro Arg Val Phe Ser Cys Asn Tyr Cys Gln Arg Lys Phe Tyr Ser Ser
50 55 60

Gln Ala Leu Gly Gly His Gln Asn Ala His Lys Leu Glu Arg Thr Leu
65 70 75 80

Ala Lys Lys Ser Arg Glu Leu Phe Arg Ser Ser Asn Thr Val Asp Ser
85 90 95

Asp Gln Pro Tyr Pro Phe Ser Gly Arg Phe Glu Leu Tyr Gly Arg Gly
100 105 110

Tyr Gln Gly Phe Leu Glu Ser Gly Gly Ser Arg Asp Phe Ser Ala Arg
115 120 125

Arg Val Pro Glu Ser Gly Leu Asp Gln Asp Gln Glu Lys Ser His Leu
130 135 140

Asp Leu Ser Leu Arg Leu
145 150

<210> 87 <211> 2217 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (37)..(2202) <223> G385

<400> 87
tagggtttgc tttcagtttc cggagtataa gaaaag atg ttc gag cca aat atg 54
Met Phe Glu Pro Asn Met
1 5

ctg ctt gcg gct atg aac aac gca gac agc aat aac cac aac tac aac 102
Leu Leu Ala Ala Met Asn Asn Ala Asp Ser Asn Asn His Asn Tyr Asn
10 15 20

cac gaa gac aac aat aat gaa gga ttt ctt cgg gac gat gaa ttc gac 150
His Glu Asp Asn Asn Asn Glu Gly Phe Leu Arg Asp Asp Glu Phe Asp
25 30 35

agt ccg aat act aaa tcg gga agt gag aat caa gaa gga gga tca gga 198
Ser Pro Asn Thr Lys Ser Gly Ser Glu Asn Gln Glu Gly Gly Ser Gly
40 45 50

aac gac caa gat cct ctt cat cct aac aag aag aaa cga tat cat cga 246
Asn Asp Gln Asp Pro Leu His Pro Asn Lys Lys Lys Arg Tyr His Arg

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55                  60                  65                  70

cac acc caa ctt cag atc cag gag atg gaa gcg ttc ttc aaa gag tgt      294
His Thr Gln Leu Gln Ile Gln Glu Met Glu Ala Phe Phe Lys Glu Cys
                75                  80                  85

cct cac cca gat gac aag caa agg aaa cag cta agc cgt gaa ttg aat      342
Pro His Pro Asp Asp Lys Gln Arg Lys Gln Leu Ser Arg Glu Leu Asn
            90                  95                  100

ttg gaa cct ctt cag gtc aaa ttc tgg ttc caa aac aaa cgt acc caa      390
Leu Glu Pro Leu Gln Val Lys Phe Trp Phe Gln Asn Lys Arg Thr Gln
        105                 110                 115

atg aag aat cat cac gag cgg cat gag aac tca cat ctt cgg gcg gag      438
Met Lys Asn His His Glu Arg His Glu Asn Ser His Leu Arg Ala Glu
    120                 125                 130

aac gaa aag ctt cga aac gac aac cta aga tat cga gag gct ctt gca      486
Asn Glu Lys Leu Arg Asn Asp Asn Leu Arg Tyr Arg Glu Ala Leu Ala
135                 140                 145                 150

aat gct tcg tgt cct aat tgt ggt ggt cca aca gct atc gga gaa atg      534
Asn Ala Ser Cys Pro Asn Cys Gly Gly Pro Thr Ala Ile Gly Glu Met
                155                 160                 165

tca ttc gac gaa cac caa ctc cgt ctc gaa aat gct cga tta agg gaa      582
Ser Phe Asp Glu His Gln Leu Arg Leu Glu Asn Ala Arg Leu Arg Glu
            170                 175                 180

gag atc gac cgt ata tcc gca atc gca gct aaa tac gta ggc aag cca      630
Glu Ile Asp Arg Ile Ser Ala Ile Ala Ala Lys Tyr Val Gly Lys Pro
        185                 190                 195

gtc tca aac tat cca ctt atg tct cct cct cct ctt cct cca cgt cca      678
Val Ser Asn Tyr Pro Leu Met Ser Pro Pro Pro Leu Pro Pro Arg Pro
    200                 205                 210

cta gaa ctc gcc atg gga aat att gga gga gaa gct tat gga aac aat      726
Leu Glu Leu Ala Met Gly Asn Ile Gly Gly Glu Ala Tyr Gly Asn Asn
215                 220                 225                 230

cca aac gat ctc ctt aag tcc atc act gca cca aca gaa tct gac aaa      774
Pro Asn Asp Leu Leu Lys Ser Ile Thr Ala Pro Thr Glu Ser Asp Lys
                235                 240                 245

cct gtc atc atc gac tta tcc gtg gct gca atg gaa gag ctc atg agg      822
Pro Val Ile Ile Asp Leu Ser Val Ala Ala Met Glu Glu Leu Met Arg
            250                 255                 260

atg gtt caa gta gac gag cct ctg tgg aag agt ttg gct tta gac gaa      870
Met Val Gln Val Asp Glu Pro Leu Trp Lys Ser Leu Ala Leu Asp Glu
        265                 270                 275

gaa gaa tat gca agg acc ttt cct aga ggg atc gga cct aga ccg gct      918
Glu Glu Tyr Ala Arg Thr Phe Pro Arg Gly Ile Gly Pro Arg Pro Ala
    280                 285                 290
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gga tat aga tca gaa gct tcg cga gaa agc gcg gtt gtg atc atg aat      966
Gly Tyr Arg Ser Glu Ala Ser Arg Glu Ser Ala Val Val Ile Met Asn
295                 300                 305                 310

cat gtt aac atc gtt gag att ctc atg gat gtg aat caa tgg tcg acg     1014
His Val Asn Ile Val Glu Ile Leu Met Asp Val Asn Gln Trp Ser Thr
                315                 320                 325

att ttc gcg ggg atg gtt tct aga gca atg aca tta gcg gtt tta tcg     1062
Ile Phe Ala Gly Met Val Ser Arg Ala Met Thr Leu Ala Val Leu Ser
            330                 335                 340

aca gga gtt gca gga aac tat aat gga gct ctt caa gtg atg agc gca     1110
Thr Gly Val Ala Gly Asn Tyr Asn Gly Ala Leu Gln Val Met Ser Ala
        345                 350                 355

gag ttt caa gtt cca tct cca tta gtc cca aca cgt gaa acc tat ttc     1158
Glu Phe Gln Val Pro Ser Pro Leu Val Pro Thr Arg Glu Thr Tyr Phe
    360                 365                 370

gca cgt tac tgt aaa caa caa gga gat ggt tcg tgg gcg gtt gtc gat     1206
Ala Arg Tyr Cys Lys Gln Gln Gly Asp Gly Ser Trp Ala Val Val Asp
375                 380                 385                 390

att tcg ttg gat agt ctc caa cca aat ccc ccg gct aga tgc agg cgg     1254
Ile Ser Leu Asp Ser Leu Gln Pro Asn Pro Pro Ala Arg Cys Arg Arg
                395                 400                 405

cga gct tca gga tgt ttg att caa gaa ttg cca aat gga tat tct aag     1302
Arg Ala Ser Gly Cys Leu Ile Gln Glu Leu Pro Asn Gly Tyr Ser Lys
            410                 415                 420

gtg act tgg gtg gag cat gtg gaa gtt gat gac aga gga gtt cat aac     1350
Val Thr Trp Val Glu His Val Glu Val Asp Asp Arg Gly Val His Asn
        425                 430                 435

tta tac aaa cac atg gtt agt act ggt cat gcc ttc ggt gct aaa cgc     1398
Leu Tyr Lys His Met Val Ser Thr Gly His Ala Phe Gly Ala Lys Arg
    440                 445                 450

tgg gta gcc att ctt gac cgc caa tgc gag cgg tta gct agt gtc atg     1446
Trp Val Ala Ile Leu Asp Arg Gln Cys Glu Arg Leu Ala Ser Val Met
455                 460                 465                 470

gct aca aac att tcc tct gga gaa gtt ggc gtg ata acc aac caa gaa     1494
Ala Thr Asn Ile Ser Ser Gly Glu Val Gly Val Ile Thr Asn Gln Glu
                475                 480                 485

ggg agg agg agt atg ctg aaa ttg gca gag cgg atg gtt ata agc ttt     1542
Gly Arg Arg Ser Met Leu Lys Leu Ala Glu Arg Met Val Ile Ser Phe
            490                 495                 500

tgt gca gga gtg agt gct tca acc gct cac acg tgg act aca ttg tcc     1590
Cys Ala Gly Val Ser Ala Ser Thr Ala His Thr Trp Thr Thr Leu Ser
        505                 510                 515
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ggt aca gga gct gaa gat gtt aga gtg atg act agg aag agt gtg gat     1638
Gly Thr Gly Ala Glu Asp Val Arg Val Met Thr Arg Lys Ser Val Asp
    520                 525                 530

gat cca gga agg tct cct ggt att gtt ctt agt gca gcc act tct ttt     1686
Asp Pro Gly Arg Ser Pro Gly Ile Val Leu Ser Ala Ala Thr Ser Phe
535                 540                 545                 550

tgg atc cct gtt cct cca aag cga gtc ttt gac ttc ctc aga gac gag     1734
Trp Ile Pro Val Pro Pro Lys Arg Val Phe Asp Phe Leu Arg Asp Glu
                555                 560                 565

aat tca aga aat gag tgg gat att ctg tct aat gga gga gtt gtg caa     1782
Asn Ser Arg Asn Glu Trp Asp Ile Leu Ser Asn Gly Gly Val Val Gln
            570                 575                 580

gaa atg gca cat att gct aac ggg agg gat acc gga aac tgt gtt tct     1830
Glu Met Ala His Ile Ala Asn Gly Arg Asp Thr Gly Asn Cys Val Ser
        585                 590                 595

ctt ctt cgg gta aat agt gca aac tct agc cag agc aat atg ctg atc     1878
Leu Leu Arg Val Asn Ser Ala Asn Ser Ser Gln Ser Asn Met Leu Ile
    600                 605                 610

cta caa gag agc tgc att gat cct aca gct tcc ttt gtg atc tat gct     1926
Leu Gln Glu Ser Cys Ile Asp Pro Thr Ala Ser Phe Val Ile Tyr Ala
615                 620                 625                 630

cca gtc gat att gta gct atg aac ata gtg ctt aat gga ggt gat cca     1974
Pro Val Asp Ile Val Ala Met Asn Ile Val Leu Asn Gly Gly Asp Pro
                635                 640                 645

gac tat gtg gct ctg ctt cca tca ggt ttt gct att ctt cct gat ggt     2022
Asp Tyr Val Ala Leu Leu Pro Ser Gly Phe Ala Ile Leu Pro Asp Gly
            650                 655                 660

aat gcc aat agt gga gcc cct gga gga gat gga ggg tcg ctc ttg act     2070
Asn Ala Asn Ser Gly Ala Pro Gly Gly Asp Gly Gly Ser Leu Leu Thr
        665                 670                 675

gtt gct ttt cag att ctg gtt gac tca gtt cct acg gct aag ctg tct     2118
Val Ala Phe Gln Ile Leu Val Asp Ser Val Pro Thr Ala Lys Leu Ser
    680                 685                 690

ctt ggc tct gtt gca act gtc aat aat cta ata gct tgc act gtt gag     2166
Leu Gly Ser Val Ala Thr Val Asn Asn Leu Ile Ala Cys Thr Val Glu
695                 700                 705                 710

aga atc aaa gct tca atg tct tgt gag act gct tga aaaccatcca ttagc    2217
Arg Ile Lys Ala Ser Met Ser Cys Glu Thr Ala
                715                 720
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<210> 88 <211> 721 <212> PRT <213> Arabidopsis thaliana <400> 88

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Met Phe Glu Pro Asn Met Leu Leu Ala Ala Met Asn Asn Ala Asp Ser
1               5                   10                  15
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Asn Asn His Asn Tyr Asn His Glu Asp Asn Asn Asn Glu Gly Phe Leu
20 25 30

Arg Asp Asp Glu Phe Asp Ser Pro Asn Thr Lys Ser Gly Ser Glu Asn
35 40 45

Gln Glu Gly Gly Ser Gly Asn Asp Gln Asp Pro Leu His Pro Asn Lys
50 55 60

Lys Lys Arg Tyr His Arg His Thr Gln Leu Gln Ile Gln Glu Met Glu
65 70 75 80

Ala Phe Phe Lys Glu Cys Pro His Pro Asp Asp Lys Gln Arg Lys Gln
85 90 95

Leu Ser Arg Glu Leu Asn Leu Glu Pro Leu Gln Val Lys Phe Trp Phe
100 105 110

Gln Asn Lys Arg Thr Gln Met Lys Asn His His Glu Arg His Glu Asn
115 120 125

Ser His Leu Arg Ala Glu Asn Glu Lys Leu Arg Asn Asp Asn Leu Arg
130 135 140

Tyr Arg Glu Ala Leu Ala Asn Ala Ser Cys Pro Asn Cys Gly Gly Pro
145 150 155 160

Thr Ala Ile Gly Glu Met Ser Phe Asp Glu His Gln Leu Arg Leu Glu
165 170 175

Asn Ala Arg Leu Arg Glu Glu Ile Asp Arg Ile Ser Ala Ile Ala Ala
180 185 190

Lys Tyr Val Gly Lys Pro Val Ser Asn Tyr Pro Leu Met Ser Pro Pro
195 200 205

Pro Leu Pro Pro Arg Pro Leu Glu Leu Ala Met Gly Asn Ile Gly Gly
210 215 220

Glu Ala Tyr Gly Asn Asn Pro Asn Asp Leu Leu Lys Ser Ile Thr Ala
225 230 235 240

Pro Thr Glu Ser Asp Lys Pro Val Ile Ile Asp Leu Ser Val Ala Ala
245 250 255

Met Glu Glu Leu Met Arg Met Val Gln Val Asp Glu Pro Leu Trp Lys
260 265 270

Ser Leu Ala Leu Asp Glu Glu Glu Tyr Ala Arg Thr Phe Pro Arg Gly
275 280 285

Ile Gly Pro Arg Pro Ala Gly Tyr Arg Ser Glu Ala Ser Arg Glu Ser
290 295 300

Ala Val Val Ile Met Asn His Val Asn Ile Val Glu Ile Leu Met Asp
305 310 315 320

Val Asn Gln Trp Ser Thr Ile Phe Ala Gly Met Val Ser Arg Ala Met
325 330 335

Thr Leu Ala Val Leu Ser Thr Gly Val Ala Gly Asn Tyr Asn Gly Ala
340 345 350

Leu Gln Val Met Ser Ala Glu Phe Gln Val Pro Ser Pro Leu Val Pro
355 360 365

Thr Arg Glu Thr Tyr Phe Ala Arg Tyr Cys Lys Gln Gln Gly Asp Gly
370 375 380

Ser Trp Ala Val Val Asp Ile Ser Leu Asp Ser Leu Gln Pro Asn Pro
385 390 395 400

Pro Ala Arg Cys Arg Arg Arg Ala Ser Gly Cys Leu Ile Gln Glu Leu
405 410 415

Pro Asn Gly Tyr Ser Lys Val Thr Trp Val Glu His Val Glu Val Asp
420 425 430

Asp Arg Gly Val His Asn Leu Tyr Lys His Met Val Ser Thr Gly His
435 440 445

Ala Phe Gly Ala Lys Arg Trp Val Ala Ile Leu Asp Arg Gln Cys Glu
450 455 460

Arg Leu Ala Ser Val Met Ala Thr Asn Ile Ser Ser Gly Glu Val Gly
465 470 475 480

Val Ile Thr Asn Gln Glu Gly Arg Arg Ser Met Leu Lys Leu Ala Glu
485 490 495

Arg Met Val Ile Ser Phe Cys Ala Gly Val Ser Ala Ser Thr Ala His
500 505 510

Thr Trp Thr Thr Leu Ser Gly Thr Gly Ala Glu Asp Val Arg Val Met
515 520 525

Thr Arg Lys Ser Val Asp Asp Pro Gly Arg Ser Pro Gly Ile Val Leu
530 535 540

Ser Ala Ala Thr Ser Phe Trp Ile Pro Val Pro Pro Lys Arg Val Phe
545 550 555 560

Asp Phe Leu Arg Asp Glu Asn Ser Arg Asn Glu Trp Asp Ile Leu Ser
565 570 575

Asn Gly Gly Val Val Gln Glu Met Ala His Ile Ala Asn Gly Arg Asp
580 585 590

Thr Gly Asn Cys Val Ser Leu Leu Arg Val Asn Ser Ala Asn Ser Ser
595 600 605

Gln Ser Asn Met Leu Ile Leu Gln Glu Ser Cys Ile Asp Pro Thr Ala
610 615 620

Ser Phe Val Ile Tyr Ala Pro Val Asp Ile Val Ala Met Asn Ile Val
625 630 635 640

Leu Asn Gly Gly Asp Pro Asp Tyr Val Ala Leu Leu Pro Ser Gly Phe
645 650 655

Ala Ile Leu Pro Asp Gly Asn Ala Asn Ser Gly Ala Pro Gly Gly Asp
660 665 670

Gly Gly Ser Leu Leu Thr Val Ala Phe Gln Ile Leu Val Asp Ser Val
675 680 685

Pro Thr Ala Lys Leu Ser Leu Gly Ser Val Ala Thr Val Asn Asn Leu

690 695 700

Ile Ala Cys Thr Val Glu Arg Ile Lys Ala Ser Met Ser Cys Glu Thr
705 710 715 720

Ala

<210> 89 <211> 957 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(957) <223> G396

<400> 89

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atg ggg gaa aga gat gat ggg ttg ggt ttg agt cta agc ttg gga aat       48
Met Gly Glu Arg Asp Asp Gly Leu Gly Leu Ser Leu Ser Leu Gly Asn
1               5                   10                  15

agt caa caa aaa gaa cca tct ctg agg ttg aat ctt atg ccg ttg aca       96
Ser Gln Gln Lys Glu Pro Ser Leu Arg Leu Asn Leu Met Pro Leu Thr
            20                  25                  30

act tct tct tct tct tct tcg ttt caa cac atg cac aat cag aat aac      144
Thr Ser Ser Ser Ser Ser Ser Phe Gln His Met His Asn Gln Asn Asn
        35                  40                  45

aat agc cat ccc cag aag att cat aac atc tct tgg act cat ctg ttt      192
Asn Ser His Pro Gln Lys Ile His Asn Ile Ser Trp Thr His Leu Phe
    50                  55                  60

caa tct tct ggg att aaa cgt aca act gca gag aga aac tcc gac gcc      240
Gln Ser Ser Gly Ile Lys Arg Thr Thr Ala Glu Arg Asn Ser Asp Ala
65                  70                  75                  80

ggg tca ttt cta aga ggt ttc aac gtg aac aga gct cag tct tcg gtg      288
Gly Ser Phe Leu Arg Gly Phe Asn Val Asn Arg Ala Gln Ser Ser Val
                85                  90                  95

gcg gta gtg gac ttg gaa gaa gaa gcc gcc gtc gtc tcg tct cca aac      336
Ala Val Val Asp Leu Glu Glu Glu Ala Ala Val Val Ser Ser Pro Asn
            100                 105                 110

agc gcc gtt tcg agt ctg agt gga aat aaa agg gat ctt gcg gtg gcg      384
Ser Ala Val Ser Ser Leu Ser Gly Asn Lys Arg Asp Leu Ala Val Ala
        115                 120                 125

aga gga gga gat gaa aac gag gcg gag aga gct tct tgc tca cgc gga      432
Arg Gly Gly Asp Glu Asn Glu Ala Glu Arg Ala Ser Cys Ser Arg Gly
    130                 135                 140

ggg gga agc ggt ggt agc gac gat gaa gac ggc gga aac ggc gac gga      480
Gly Gly Ser Gly Gly Ser Asp Asp Glu Asp Gly Gly Asn Gly Asp Gly
145                 150                 155                 160

tca agg aag aaa cta cgg tta tcg aag gat caa gct ctt gtt ctc gag      528
Ser Arg Lys Lys Leu Arg Leu Ser Lys Asp Gln Ala Leu Val Leu Glu
```

```
                165                 170                 175

gag act ttt aaa gaa cat agc act ctt aat ccg aag caa aag ctg gct      576
Glu Thr Phe Lys Glu His Ser Thr Leu Asn Pro Lys Gln Lys Leu Ala
            180                 185                 190

cta gca aaa cag ttg aat cta agg gca aga caa gtt gaa gtg tgg ttt      624
Leu Ala Lys Gln Leu Asn Leu Arg Ala Arg Gln Val Glu Val Trp Phe
        195                 200                 205

cag aac cgt agg gca agg acg aag ctg aaa caa acg gag gtt gat tgt      672
Gln Asn Arg Arg Ala Arg Thr Lys Leu Lys Gln Thr Glu Val Asp Cys
    210                 215                 220

gag tat tta aag aga tgt tgc gat aat ctg acc gag gag aat cga cgg      720
Glu Tyr Leu Lys Arg Cys Cys Asp Asn Leu Thr Glu Glu Asn Arg Arg
225                 230                 235                 240

ctg cag aaa gaa gtg tcg gag ctg agg gcg ttg aag ttg tct cca cat      768
Leu Gln Lys Glu Val Ser Glu Leu Arg Ala Leu Lys Leu Ser Pro His
                245                 250                 255

ctc tac atg cac atg act cct cct act act ctc acc atg tgc cct tct      816
Leu Tyr Met His Met Thr Pro Pro Thr Thr Leu Thr Met Cys Pro Ser
            260                 265                 270

tgc gaa cgt gtc tcc tcc tct gcc gcc act gtg acc gct gct cct tcc      864
Cys Glu Arg Val Ser Ser Ser Ala Ala Thr Val Thr Ala Ala Pro Ser
        275                 280                 285

act act act act cct acg gtg gtg ggg cgg cca agt cca cag cga tta      912
Thr Thr Thr Thr Pro Thr Val Val Gly Arg Pro Ser Pro Gln Arg Leu
    290                 295                 300

act cct tgg act gct att tct ctc cag caa aaa tca ggt cgc tag          957
Thr Pro Trp Thr Ala Ile Ser Leu Gln Gln Lys Ser Gly Arg
305                 310                 315
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<210> 90 <211> 318 <212> PRT <213> Arabidopsis thaliana <400> 90

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Met Gly Glu Arg Asp Asp Gly Leu Gly Leu Ser Leu Ser Leu Gly Asn
1               5                   10                  15

Ser Gln Gln Lys Glu Pro Ser Leu Arg Leu Asn Leu Met Pro Leu Thr
            20                  25                  30

Thr Ser Ser Ser Ser Ser Ser Phe Gln His Met His Asn Gln Asn Asn
        35                  40                  45

Asn Ser His Pro Gln Lys Ile His Asn Ile Ser Trp Thr His Leu Phe
    50                  55                  60
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Gln Ser Ser Gly Ile Lys Arg Thr Thr Ala Glu Arg Asn Ser Asp Ala
65 70 75 80

Gly Ser Phe Leu Arg Gly Phe Asn Val Asn Arg Ala Gln Ser Ser Val
85 90 95

Ala Val Val Asp Leu Glu Glu Glu Ala Ala Val Val Ser Ser Pro Asn
100 105 110

Ser Ala Val Ser Ser Leu Ser Gly Asn Lys Arg Asp Leu Ala Val Ala
115 120 125

Arg Gly Gly Asp Glu Asn Glu Ala Glu Arg Ala Ser Cys Ser Arg Gly
130 135 140

Gly Gly Ser Gly Gly Ser Asp Asp Glu Asp Gly Gly Asn Gly Asp Gly
145 150 155 160

Ser Arg Lys Lys Leu Arg Leu Ser Lys Asp Gln Ala Leu Val Leu Glu
165 170 175

Glu Thr Phe Lys Glu His Ser Thr Leu Asn Pro Lys Gln Lys Leu Ala
180 185 190

Leu Ala Lys Gln Leu Asn Leu Arg Ala Arg Gln Val Glu Val Trp Phe
195 200 205

Gln Asn Arg Arg Ala Arg Thr Lys Leu Lys Gln Thr Glu Val Asp Cys
210 215 220

Glu Tyr Leu Lys Arg Cys Cys Asp Asn Leu Thr Glu Glu Asn Arg Arg
225 230 235 240

Leu Gln Lys Glu Val Ser Glu Leu Arg Ala Leu Lys Leu Ser Pro His
245 250 255

Leu Tyr Met His Met Thr Pro Pro Thr Thr Leu Thr Met Cys Pro Ser
260 265 270

Cys Glu Arg Val Ser Ser Ser Ala Ala Thr Val Thr Ala Ala Pro Ser
275 280 285

Thr Thr Thr Thr Pro Thr Val Val Gly Arg Pro Ser Pro Gln Arg Leu

290 295 300

Thr Pro Trp Thr Ala Ile Ser Leu Gln Gln Lys Ser Gly Arg
305 310 315

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agggcttctt ctctttgttt ctccaatctt tattagttta tttatttatt ttggttattg 120

tatacaa atg gca atg gct tta aac atg aat gct tac gta gac gag ttc 169
Met Ala Met Ala Leu Asn Met Asn Ala Tyr Val Asp Glu Phe
1 5 10

atg gaa gct ctt gaa cca ttc atg aag gta act tca tct tct tct act 217
Met Glu Ala Leu Glu Pro Phe Met Lys Val Thr Ser Ser Ser Ser Thr
15 20 25 30

tcg aat tca tca aat cca aaa cca tta act cct aat ttc atc cct aat 265
Ser Asn Ser Ser Asn Pro Lys Pro Leu Thr Pro Asn Phe Ile Pro Asn
35 40 45

aat gac caa gtc tta ccg gta tct aac caa acc ggt ccg att ggg cta 313
Asn Asp Gln Val Leu Pro Val Ser Asn Gln Thr Gly Pro Ile Gly Leu
50 55 60

aac cag ctc act cca aca caa atc ctc caa att cag aca gag tta cat 361
Asn Gln Leu Thr Pro Thr Gln Ile Leu Gln Ile Gln Thr Glu Leu His
65 70 75

ctc cgg caa aac caa tct cgt cgt cgc gct ggt agt cat ctt ctc acc 409
Leu Arg Gln Asn Gln Ser Arg Arg Arg Ala Gly Ser His Leu Leu Thr
80 85 90

gct aaa cca acc tca atg aag aaa atc gac gta gca act aaa ccg gtt 457
Ala Lys Pro Thr Ser Met Lys Lys Ile Asp Val Ala Thr Lys Pro Val
95 100 105 110

aaa cta tac cga ggc gta aga cag agg caa tgg ggt aaa tgg gta gct 505
Lys Leu Tyr Arg Gly Val Arg Gln Arg Gln Trp Gly Lys Trp Val Ala
115 120 125

gag att cgg cta cct aaa aac cga acc cgg tta tgg ctc ggt acg ttc 553
Glu Ile Arg Leu Pro Lys Asn Arg Thr Arg Leu Trp Leu Gly Thr Phe
130 135 140

gaa acg gct caa gaa gct gca tta gct tac gat caa gca gct cat aag 601
Glu Thr Ala Gln Glu Ala Ala Leu Ala Tyr Asp Gln Ala Ala His Lys
145 150 155

atc aga gga gac aac gct cgt ctc aat ttc cca gac att gtt cgt caa 649
Ile Arg Gly Asp Asn Ala Arg Leu Asn Phe Pro Asp Ile Val Arg Gln

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    160                 165                 170

gga cac tat aaa cag ata ttg tct ccg tct atc aac gca aag atc gaa      697
Gly His Tyr Lys Gln Ile Leu Ser Pro Ser Ile Asn Ala Lys Ile Glu
175                 180                 185                 190

tcc atc tgc aat agt tct gat ctt cca ctg cct cag atc gag aaa cag      745
Ser Ile Cys Asn Ser Ser Asp Leu Pro Leu Pro Gln Ile Glu Lys Gln
                195                 200                 205

aac aaa aca gag gag gtg ctc tct ggt ttt tcc aaa ccg gag aaa gaa      793
Asn Lys Thr Glu Glu Val Leu Ser Gly Phe Ser Lys Pro Glu Lys Glu
            210                 215                 220

ccg gaa ttt ggg gag ata tac gga tgc gga tac tcg ggc tca tct cct      841
Pro Glu Phe Gly Glu Ile Tyr Gly Cys Gly Tyr Ser Gly Ser Ser Pro
        225                 230                 235

gag tcg gat ata acg ttg ttg gat ttc tca agc gac tgt gtg aaa gaa      889
Glu Ser Asp Ile Thr Leu Leu Asp Phe Ser Ser Asp Cys Val Lys Glu
    240                 245                 250

gat gag agt ttc ttg atg ggt ttg cac aag tat cct tct ttg gag att      937
Asp Glu Ser Phe Leu Met Gly Leu His Lys Tyr Pro Ser Leu Glu Ile
255                 260                 265                 270

gat tgg gac gct ata gag aaa ctc ttc tga atccatttta tctttttgat        987
Asp Trp Asp Ala Ile Glu Lys Leu Phe
                275

tcatttgtct ctaaattgta gaattttatt ttcagagctt tgtaagggaa gttcttgaat   1047

gagagttgca gaggactagt ggaacctaac tctgttttct tttgtaagta ttgtttataa   1107

tgggccgttg aatgggcctt attgatttaa acagcccaag tttttaaaaa aaaaaaaaaa   1167

aaaaaaaaaa                                                          1177
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Met Ala Met Ala Leu Asn Met Asn Ala Tyr Val Asp Glu Phe Met Glu
1               5                   10                  15

Ala Leu Glu Pro Phe Met Lys Val Thr Ser Ser Ser Ser Thr Ser Asn
            20                  25                  30

Ser Ser Asn Pro Lys Pro Leu Thr Pro Asn Phe Ile Pro Asn Asn Asp
        35                  40                  45

Gln Val Leu Pro Val Ser Asn Gln Thr Gly Pro Ile Gly Leu Asn Gln
    50                  55                  60
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Leu Thr Pro Thr Gln Ile Leu Gln Ile Gln Thr Glu Leu His Leu Arg
65 70 75 80

Gln Asn Gln Ser Arg Arg Arg Ala Gly Ser His Leu Leu Thr Ala Lys
85 90 95

Pro Thr Ser Met Lys Lys Ile Asp Val Ala Thr Lys Pro Val Lys Leu
100 105 110

Tyr Arg Gly Val Arg Gln Arg Gln Trp Gly Lys Trp Val Ala Glu Ile
115 120 125

Arg Leu Pro Lys Asn Arg Thr Arg Leu Trp Leu Gly Thr Phe Glu Thr
130 135 140

Ala Gln Glu Ala Ala Leu Ala Tyr Asp Gln Ala Ala His Lys Ile Arg
145 150 155 160

Gly Asp Asn Ala Arg Leu Asn Phe Pro Asp Ile Val Arg Gln Gly His
165 170 175

Tyr Lys Gln Ile Leu Ser Pro Ser Ile Asn Ala Lys Ile Glu Ser Ile
180 185 190

Cys Asn Ser Ser Asp Leu Pro Leu Pro Gln Ile Glu Lys Gln Asn Lys
195 200 205

Thr Glu Glu Val Leu Ser Gly Phe Ser Lys Pro Glu Lys Glu Pro Glu
210 215 220

Phe Gly Glu Ile Tyr Gly Cys Gly Tyr Ser Gly Ser Ser Pro Glu Ser
225 230 235 240

Asp Ile Thr Leu Leu Asp Phe Ser Ser Asp Cys Val Lys Glu Asp Glu
245 250 255

Ser Phe Leu Met Gly Leu His Lys Tyr Pro Ser Leu Glu Ile Asp Trp
260 265 270

Asp Ala Ile Glu Lys Leu Phe
275

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<400> 93

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                                             Met Arg Gly Val Ser
                                             1               5

gaa ttg gag gtg ggg aag agt aat ctt ccg gcg gag agt gag ctg gaa      103
Glu Leu Glu Val Gly Lys Ser Asn Leu Pro Ala Glu Ser Glu Leu Glu
                10                  15                  20

ttg gga tta ggg ctc agc ctc ggt ggt ggc gcg tgg aaa gag cgt ggg      151
Leu Gly Leu Gly Leu Ser Leu Gly Gly Gly Ala Trp Lys Glu Arg Gly
            25                  30                  35

agg att ctt act gct aag gat ttt cct tcc gtt ggg tct aaa cgc tct      199
Arg Ile Leu Thr Ala Lys Asp Phe Pro Ser Val Gly Ser Lys Arg Ser
        40                  45                  50

gct gaa tct tcc tct cac caa gga gct tct cct cct cgt tca agt caa      247
Ala Glu Ser Ser Ser His Gln Gly Ala Ser Pro Pro Arg Ser Ser Gln
    55                  60                  65

gtg gta gga tgg cca cca att ggg tta cac agg atg aac agt ttg gtt      295
Val Val Gly Trp Pro Pro Ile Gly Leu His Arg Met Asn Ser Leu Val
70                  75                  80                  85

aat aac caa gct atg aag gca gca aga gcg gaa gaa gga gac ggg gag      343
Asn Asn Gln Ala Met Lys Ala Ala Arg Ala Glu Glu Gly Asp Gly Glu
                90                  95                  100

aag aaa gtt gtg aag aat gat gag ctc aaa gat gtg tca atg aag gtg      391
Lys Lys Val Val Lys Asn Asp Glu Leu Lys Asp Val Ser Met Lys Val
            105                 110                 115

aat ccg aaa gtt cag ggc tta ggg ttt gtt aag gtg aat atg gat gga      439
Asn Pro Lys Val Gln Gly Leu Gly Phe Val Lys Val Asn Met Asp Gly
        120                 125                 130

gtt ggt ata ggc aga aaa gtg gat atg aga gct cat tcg tct tac gaa      487
Val Gly Ile Gly Arg Lys Val Asp Met Arg Ala His Ser Ser Tyr Glu
    135                 140                 145

aac ttg gct cag acg ctt gag gaa atg ttc ttt gga atg aca ggt act      535
Asn Leu Ala Gln Thr Leu Glu Glu Met Phe Phe Gly Met Thr Gly Thr
150                 155                 160                 165

act tgt cga gaa aag gtt aaa cct tta agg ctt tta gat gga tca tca      583
Thr Cys Arg Glu Lys Val Lys Pro Leu Arg Leu Leu Asp Gly Ser Ser
                170                 175                 180

gac ttt gta ctc act tat gaa gat aag gaa ggg gat tgg atg ctt gtt      631
Asp Phe Val Leu Thr Tyr Glu Asp Lys Glu Gly Asp Trp Met Leu Val
            185                 190                 195

gga gat gtt cca tgg aga atg ttt atc aac tcg gtg aaa agg ctt cgg      679
```

Gly Asp Val Pro Trp Arg Met Phe Ile Asn Ser Val Lys Arg Leu Arg
200 205 210

atc atg gga acc tca gaa gct agt gga cta gct cca aga cgt caa gag 727
Ile Met Gly Thr Ser Glu Ala Ser Gly Leu Ala Pro Arg Arg Gln Glu
215 220 225

cag aag gat aga caa aga aac aac cct gtt tag cttcccttcc aaagctggca 780
Gln Lys Asp Arg Gln Arg Asn Asn Pro Val
230 235

ttgtttatgt attgtttgag gtttgcaatt tactcgatac tttttgaaga aagtattttg 840

gagaatatgg ataaaagcat gcagaagctt agatatgatt tgaatccggt tttcggatat 900

ggttttgctt aggtcattca attcgtagtt ttccagtttg tttcttcttt ggctgtgtac 960

caattatcta tgttctgtga gagaaagctc tt 992

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Met Arg Gly Val Ser Glu Leu Glu Val Gly Lys Ser Asn Leu Pro Ala
1 5 10 15

Glu Ser Glu Leu Glu Leu Gly Leu Gly Leu Ser Leu Gly Gly Gly Ala
20 25 30

Trp Lys Glu Arg Gly Arg Ile Leu Thr Ala Lys Asp Phe Pro Ser Val
35 40 45

Gly Ser Lys Arg Ser Ala Glu Ser Ser Ser His Gln Gly Ala Ser Pro
50 55 60

Pro Arg Ser Ser Gln Val Val Gly Trp Pro Pro Ile Gly Leu His Arg
65 70 75 80

Met Asn Ser Leu Val Asn Asn Gln Ala Met Lys Ala Ala Arg Ala Glu
85 90 95

Glu Gly Asp Gly Glu Lys Lys Val Val Lys Asn Asp Glu Leu Lys Asp
100 105 110

Val Ser Met Lys Val Asn Pro Lys Val Gln Gly Leu Gly Phe Val Lys
115 120 125

Val Asn Met Asp Gly Val Gly Ile Gly Arg Lys Val Asp Met Arg Ala
130 135 140

```
His Ser Ser Tyr Glu Asn Leu Ala Gln Thr Leu Glu Glu Met Phe Phe
145                 150                 155                 160

Gly Met Thr Gly Thr Thr Cys Arg Glu Lys Val Lys Pro Leu Arg Leu
                165                 170                 175

Leu Asp Gly Ser Ser Asp Phe Val Leu Thr Tyr Glu Asp Lys Glu Gly
            180                 185                 190

Asp Trp Met Leu Val Gly Asp Val Pro Trp Arg Met Phe Ile Asn Ser
        195                 200                 205

Val Lys Arg Leu Arg Ile Met Gly Thr Ser Glu Ala Ser Gly Leu Ala
    210                 215                 220

Pro Arg Arg Gln Glu Gln Lys Asp Arg Gln Arg Asn Asn Pro Val
225                 230                 235
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<222> (1)..(1218) <223> G477

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atg gat tct tgg agc tac ggg aga agc gtt ttc atg tca aat gaa act       48
Met Asp Ser Trp Ser Tyr Gly Arg Ser Val Phe Met Ser Asn Glu Thr
1               5                   10                  15

ctt tta cct tgt gat act ttt gct aag aat aga aga ttt gaa cag aga       96
Leu Leu Pro Cys Asp Thr Phe Ala Lys Asn Arg Arg Phe Glu Gln Arg
            20                  25                  30

ctc tct aat aat gat gat gtg ttg att tct gac atg gct ggt aac tcc      144
Leu Ser Asn Asn Asp Asp Val Leu Ile Ser Asp Met Ala Gly Asn Ser
        35                  40                  45

aat gga ttc agt gct gtt tct att act aaa gtt gtt cct gaa gag gaa      192
Asn Gly Phe Ser Ala Val Ser Ile Thr Lys Val Val Pro Glu Glu Glu
    50                  55                  60

gat gag gag aac ata tct tct tct tca aag ttc tct agt cag gaa ttg      240
Asp Glu Glu Asn Ile Ser Ser Ser Ser Lys Phe Ser Ser Gln Glu Leu
65                  70                  75                  80

aat agg ata gat ttc aaa ctt agg agc ttt ttg gat tta gga aat gat      288
Asn Arg Ile Asp Phe Lys Leu Arg Ser Phe Leu Asp Leu Gly Asn Asp
                85                  90                  95

gat gat gat aca tcc tct aga ggt ttt gct ctg cca tct aaa aag tct      336
Asp Asp Asp Thr Ser Ser Arg Gly Phe Ala Leu Pro Ser Lys Lys Ser
            100                 105                 110
```

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cga gct tca aac ttg tgc tct cag aat ccc ttg tgt caa gtt tat ggg      384
Arg Ala Ser Asn Leu Cys Ser Gln Asn Pro Leu Cys Gln Val Tyr Gly
        115                 120                 125

tgt agt aag gat ctg agc tct tcg aaa gat tac cac aaa agg cat aga      432
Cys Ser Lys Asp Leu Ser Ser Ser Lys Asp Tyr His Lys Arg His Arg
    130                 135                 140

gtt tgc gag gct cat tcg aaa act tct gtg gtc ata gtt aat ggt ctt      480
Val Cys Glu Ala His Ser Lys Thr Ser Val Val Ile Val Asn Gly Leu
145                 150                 155                 160

gaa cag agg ttt tgt caa cag tgc agc agg ttt cat ttc ctc tca gag      528
Glu Gln Arg Phe Cys Gln Gln Cys Ser Arg Phe His Phe Leu Ser Glu
                165                 170                 175

ttt gat gat ggc aaa aga agt tgc aga agg cga tta gcc ggt cac aat      576
Phe Asp Asp Gly Lys Arg Ser Cys Arg Arg Arg Leu Ala Gly His Asn
            180                 185                 190

gaa cga aga agg aaa cct gca ttc tat ttc cta ccg ggt aag cgc cat      624
Glu Arg Arg Arg Lys Pro Ala Phe Tyr Phe Leu Pro Gly Lys Arg His
        195                 200                 205

aag ctt ctt cgc acc tct caa gat gta gta ggc aac aag ttt ctg gag      672
Lys Leu Leu Arg Thr Ser Gln Asp Val Val Gly Asn Lys Phe Leu Glu
    210                 215                 220

aat tca tca ttg gta ttg cca gag tca ttt cct ggt agt ctc tta tac      720
Asn Ser Ser Leu Val Leu Pro Glu Ser Phe Pro Gly Ser Leu Leu Tyr
225                 230                 235                 240

aga gta ata gat gaa gac gac cac cgt aca agt aga ctc gtg agt ttc      768
Arg Val Ile Asp Glu Asp Asp His Arg Thr Ser Arg Leu Val Ser Phe
                245                 250                 255

aaa gat gaa cct act tgt tcc atg ttt cct act aat gag caa aac agc      816
Lys Asp Glu Pro Thr Cys Ser Met Phe Pro Thr Asn Glu Gln Asn Ser
            260                 265                 270

agc aga act tat gaa tct aaa cca gca att tat tcc acg gaa gta tcc      864
Ser Arg Thr Tyr Glu Ser Lys Pro Ala Ile Tyr Ser Thr Glu Val Ser
        275                 280                 285

tcc att tgg gac tta cat gag acg gcg gca tca cgc tct act cgt gct      912
Ser Ile Trp Asp Leu His Glu Thr Ala Ala Ser Arg Ser Thr Arg Ala
    290                 295                 300

ctc tct ctt ctg tca gct cag tcc caa caa cac ttg tct aag ttt cca      960
Leu Ser Leu Leu Ser Ala Gln Ser Gln Gln His Leu Ser Lys Phe Pro
305                 310                 315                 320

aac aca acg ttc tca atc acc caa ccc aac caa aat ctc aat cac tca     1008
Asn Thr Thr Phe Ser Ile Thr Gln Pro Asn Gln Asn Leu Asn His Ser
                325                 330                 335

tca tca act gac tat cat cag atg gaa caa ccg ttg tgg atc gat cct     1056
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```
Ser Ser Thr Asp Tyr His Gln Met Glu Gln Pro Leu Trp Ile Asp Pro
            340                 345                 350

ggc aag acc aat tct gct ggt tct agt tct tgt aaa gga aaa gga aca     1104
Gly Lys Thr Asn Ser Ala Gly Ser Ser Ser Cys Lys Gly Lys Gly Thr
        355                 360                 365

tcc acg gtt gat cta ctg caa ctg tca tca cat ctt caa aga atc gag     1152
Ser Thr Val Asp Leu Leu Gln Leu Ser Ser His Leu Gln Arg Ile Glu
    370                 375                 380

caa cag agg aat tac act ggt gat gtg aag cag gaa tat aat gag ctt     1200
Gln Gln Arg Asn Tyr Thr Gly Asp Val Lys Gln Glu Tyr Asn Glu Leu
385                 390                 395                 400

tat ttc cct ggc tcc taa                                            1218
Tyr Phe Pro Gly Ser
                405
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Patented 25 Jan 2005

<210> 96 <211> 405 <212> PRT <213> Arabidopsis thaliana <400> 96

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Met Asp Ser Trp Ser Tyr Gly Arg Ser Val Phe Met Ser Asn Glu Thr
1               5                   10                  15

Leu Leu Pro Cys Asp Thr Phe Ala Lys Asn Arg Arg Phe Glu Gln Arg
            20                  25                  30

Leu Ser Asn Asn Asp Asp Val Leu Ile Ser Asp Met Ala Gly Asn Ser
        35                  40                  45

Asn Gly Phe Ser Ala Val Ser Ile Thr Lys Val Val Pro Glu Glu Glu
    50                  55                  60

Asp Glu Glu Asn Ile Ser Ser Ser Ser Lys Phe Ser Ser Gln Glu Leu
65                  70                  75                  80

Asn Arg Ile Asp Phe Lys Leu Arg Ser Phe Leu Asp Leu Gly Asn Asp
                85                  90                  95

Asp Asp Asp Thr Ser Ser Arg Gly Phe Ala Leu Pro Ser Lys Lys Ser
            100                 105                 110

Arg Ala Ser Asn Leu Cys Ser Gln Asn Pro Leu Cys Gln Val Tyr Gly
        115                 120                 125

Cys Ser Lys Asp Leu Ser Ser Ser Lys Asp Tyr His Lys Arg His Arg
    130                 135                 140
```

Val Cys Glu Ala His Ser Lys Thr Ser Val Val Ile Val Asn Gly Leu
145 150 155 160

Glu Gln Arg Phe Cys Gln Gln Cys Ser Arg Phe His Phe Leu Ser Glu
165 170 175

Phe Asp Asp Gly Lys Arg Ser Cys Arg Arg Arg Leu Ala Gly His Asn
180 185 190

Glu Arg Arg Arg Lys Pro Ala Phe Tyr Phe Leu Pro Gly Lys Arg His
195 200 205

Lys Leu Leu Arg Thr Ser Gln Asp Val Val Gly Asn Lys Phe Leu Glu
210 215 220

Asn Ser Ser Leu Val Leu Pro Glu Ser Phe Pro Gly Ser Leu Leu Tyr
225 230 235 240

Arg Val Ile Asp Glu Asp Asp His Arg Thr Ser Arg Leu Val Ser Phe
245 250 255

Lys Asp Glu Pro Thr Cys Ser Met Phe Pro Thr Asn Glu Gln Asn Ser
260 265 270

Ser Arg Thr Tyr Glu Ser Lys Pro Ala Ile Tyr Ser Thr Glu Val Ser
275 280 285

Ser Ile Trp Asp Leu His Glu Thr Ala Ala Ser Arg Ser Thr Arg Ala
290 295 300

Leu Ser Leu Leu Ser Ala Gln Ser Gln Gln His Leu Ser Lys Phe Pro
305 310 315 320

Asn Thr Thr Phe Ser Ile Thr Gln Pro Asn Gln Asn Leu Asn His Ser
325 330 335

Ser Ser Thr Asp Tyr His Gln Met Glu Gln Pro Leu Trp Ile Asp Pro
340 345 350

Gly Lys Thr Asn Ser Ala Gly Ser Ser Ser Cys Lys Gly Lys Gly Thr
355 360 365

```
Ser Thr Val Asp Leu Leu Gln Leu Ser Ser His Leu Gln Arg Ile Glu
    370                 375                 380

Gln Gln Arg Asn Tyr Thr Gly Asp Val Lys Gln Glu Tyr Asn Glu Leu
385                 390                 395                 400

Tyr Phe Pro Gly Ser
                405
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<400> 97

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Met Arg Arg Pro Lys Ser Ser His Val Arg Met Glu Pro Val Ala Pro
1               5                   10                  15

cgt tca cat aac acg atg cca atg ctt gat caa ttt cga tct aat cat       96
Arg Ser His Asn Thr Met Pro Met Leu Asp Gln Phe Arg Ser Asn His
            20                  25                  30

cct gaa aca agc aag atc gag ggg gtc tct tcg ttg gac aca gct ctg      144
Pro Glu Thr Ser Lys Ile Glu Gly Val Ser Ser Leu Asp Thr Ala Leu
        35                  40                  45

aag gtg ttt tgg aat aat caa agg gag cag cta gga aac ttt gca ggc      192
Lys Val Phe Trp Asn Asn Gln Arg Glu Gln Leu Gly Asn Phe Ala Gly
    50                  55                  60

caa act cat ttg ccg cta tct agg gtc aga aag att ttg aaa tct gat      240
Gln Thr His Leu Pro Leu Ser Arg Val Arg Lys Ile Leu Lys Ser Asp
65                  70                  75                  80

cct gaa gtc aag aag ata agc tgt gat gtt cct gct ttg ttt tcg aaa      288
Pro Glu Val Lys Lys Ile Ser Cys Asp Val Pro Ala Leu Phe Ser Lys
                85                  90                  95

gcc tgt gaa tac ttc att cta gag gta aca tta cga gct tgg atg cat      336
Ala Cys Glu Tyr Phe Ile Leu Glu Val Thr Leu Arg Ala Trp Met His
            100                 105                 110

act caa tca tgc act cgt gag acc atc cgg cgt tgt gat atc ttc cag      384
Thr Gln Ser Cys Thr Arg Glu Thr Ile Arg Arg Cys Asp Ile Phe Gln
        115                 120                 125

gcc gta aag aac tca gga act tat gat ttc ctg att gat cgt gtc cct      432
Ala Val Lys Asn Ser Gly Thr Tyr Asp Phe Leu Ile Asp Arg Val Pro
    130                 135                 140

ttt gga ccg cac tgt gtc acc cat cag ggt gtg caa cct cct gct gaa      480
Phe Gly Pro His Cys Val Thr His Gln Gly Val Gln Pro Pro Ala Glu
145                 150                 155                 160

atg att ttg ccg gat atg aat gtt cca atc gat atg gac cag att gag      528
```

Met Ile Leu Pro Asp Met Asn Val Pro Ile Asp Met Asp Gln Ile Glu
165 170 175

gag gag aat atg atg gaa gag cgc tct gtc ggg ttt gac ctc aac tgt 576
Glu Glu Asn Met Met Glu Glu Arg Ser Val Gly Phe Asp Leu Asn Cys
180 185 190

gat ctc cag tga 588
Asp Leu Gln
195

<210> 98 <211> 195 <212> PRT <213> Arabidopsis thaliana <400> 98

Met Arg Arg Pro Lys Ser Ser His Val Arg Met Glu Pro Val Ala Pro
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Arg Ser His Asn Thr Met Pro Met Leu Asp Gln Phe Arg Ser Asn His
20 25 30

Pro Glu Thr Ser Lys Ile Glu Gly Val Ser Ser Leu Asp Thr Ala Leu
35 40 45

Lys Val Phe Trp Asn Asn Gln Arg Glu Gln Leu Gly Asn Phe Ala Gly
50 55 60

Gln Thr His Leu Pro Leu Ser Arg Val Arg Lys Ile Leu Lys Ser Asp
65 70 75 80

Pro Glu Val Lys Lys Ile Ser Cys Asp Val Pro Ala Leu Phe Ser Lys
85 90 95

Ala Cys Glu Tyr Phe Ile Leu Glu Val Thr Leu Arg Ala Trp Met His
100 105 110

Thr Gln Ser Cys Thr Arg Glu Thr Ile Arg Arg Cys Asp Ile Phe Gln
115 120 125

Ala Val Lys Asn Ser Gly Thr Tyr Asp Phe Leu Ile Asp Arg Val Pro
130 135 140

Phe Gly Pro His Cys Val Thr His Gln Gly Val Gln Pro Pro Ala Glu
145 150 155 160

Met Ile Leu Pro Asp Met Asn Val Pro Ile Asp Met Asp Gln Ile Glu
165 170 175

```
Glu Glu Asn Met Met Glu Glu Arg Ser Val Gly Phe Asp Leu Asn Cys
            180                 185                 190

Asp Leu Gln
        195
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<210> 99 <211> 890 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (55)..(738) <223> G545

<400> 99

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gcaaccttca aactaaaact cgagagacaa gaaatcctca gaatctttaa ctta atg       57
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                                                           1

gcg ctc gag gct ctt aca tca cca aga tta gct tct ccg att cct cct      105
Ala Leu Glu Ala Leu Thr Ser Pro Arg Leu Ala Ser Pro Ile Pro Pro
            5                   10                  15

ttg ttc gaa gat tct tca gtc ttc cat gga gtc gag cac tgg aca aag      153
Leu Phe Glu Asp Ser Ser Val Phe His Gly Val Glu His Trp Thr Lys
        20                  25                  30

ggt aag cga tct aag aga tca aga tcc gat ttc cac cac caa aac ctc      201
Gly Lys Arg Ser Lys Arg Ser Arg Ser Asp Phe His His Gln Asn Leu
    35                  40                  45

act gag gaa gag tat cta gct ttt tgc ctc atg ctt ctc gct cgc gac      249
Thr Glu Glu Glu Tyr Leu Ala Phe Cys Leu Met Leu Leu Ala Arg Asp
50                  55                  60                  65

aac cgt cag cct cct cct cct ccg gcg gtg gag aag ttg agc tac aag      297
Asn Arg Gln Pro Pro Pro Pro Pro Ala Val Glu Lys Leu Ser Tyr Lys
                70                  75                  80

tgt agc gtc tgc gac aag acg ttc tct tct tac caa gct ctc ggt ggt      345
Cys Ser Val Cys Asp Lys Thr Phe Ser Ser Tyr Gln Ala Leu Gly Gly
            85                  90                  95

cac aag gca agc cac cgt aag aac tta tca cag act ctc tcc ggc gga      393
His Lys Ala Ser His Arg Lys Asn Leu Ser Gln Thr Leu Ser Gly Gly
        100                 105                 110

gga gat gat cat tca acc tcg tcg gcg aca acc aca tcc gcc gtg act      441
Gly Asp Asp His Ser Thr Ser Ser Ala Thr Thr Thr Ser Ala Val Thr
    115                 120                 125

act gga agt ggg aaa tca cac gtt tgc acc atc tgt aac aag tct ttt      489
Thr Gly Ser Gly Lys Ser His Val Cys Thr Ile Cys Asn Lys Ser Phe
130                 135                 140                 145

cct tcc ggt caa gct ctc ggc gga cac aag cgg tgc cac tac gaa gga      537
Pro Ser Gly Gln Ala Leu Gly Gly His Lys Arg Cys His Tyr Glu Gly
                150                 155                 160
```

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aac aac aac atc aac act agt agc gtg tcc aac tcc gaa ggt gcg ggg      585
Asn Asn Asn Ile Asn Thr Ser Ser Val Ser Asn Ser Glu Gly Ala Gly
            165                 170                 175

tcc act agc cac gtt agc agt agc cac cgt ggg ttt gac ctc aac atc      633
Ser Thr Ser His Val Ser Ser Ser His Arg Gly Phe Asp Leu Asn Ile
        180                 185                 190

cct ccg atc cct gaa ttc tcg atg gtc aac gga gac gac gaa gtc atg      681
Pro Pro Ile Pro Glu Phe Ser Met Val Asn Gly Asp Asp Glu Val Met
    195                 200                 205

agc cct atg ccg gcg aag aag cct cgg ttt gac ttt ccg gtc aaa ctt      729
Ser Pro Met Pro Ala Lys Lys Pro Arg Phe Asp Phe Pro Val Lys Leu
210                 215                 220                 225

caa ctt taa ggaaatttac ttagacgata agatttcgtt tgtatactgt              778
Gln Leu

tgagagttgt gtaggaattt gttgactgta cataccaaat tggactttga ctgattccaa    838

ttcttcttgt tctttcattt taaaaattat taaaccgatt ctttaccaca aa            890

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Met Ala Leu Glu Ala Leu Thr Ser Pro Arg Leu Ala Ser Pro Ile Pro
1               5                   10                  15

Pro Leu Phe Glu Asp Ser Ser Val Phe His Gly Val Glu His Trp Thr
            20                  25                  30

Lys Gly Lys Arg Ser Lys Arg Ser Arg Ser Asp Phe His His Gln Asn
        35                  40                  45

Leu Thr Glu Glu Glu Tyr Leu Ala Phe Cys Leu Met Leu Leu Ala Arg
    50                  55                  60

Asp Asn Arg Gln Pro Pro Pro Pro Pro Ala Val Glu Lys Leu Ser Tyr
65                  70                  75                  80

Lys Cys Ser Val Cys Asp Lys Thr Phe Ser Ser Tyr Gln Ala Leu Gly
                85                  90                  95

Gly His Lys Ala Ser His Arg Lys Asn Leu Ser Gln Thr Leu Ser Gly
            100                 105                 110

Gly Gly Asp Asp His Ser Thr Ser Ser Ala Thr Thr Thr Ser Ala Val
        115                 120                 125
```

```
Thr Thr Gly Ser Gly Lys Ser His Val Cys Thr Ile Cys Asn Lys Ser
    130                 135                 140

Phe Pro Ser Gly Gln Ala Leu Gly Gly His Lys Arg Cys His Tyr Glu
145                 150                 155                 160

Gly Asn Asn Asn Ile Asn Thr Ser Ser Val Ser Asn Ser Glu Gly Ala
                165                 170                 175

Gly Ser Thr Ser His Val Ser Ser Ser His Arg Gly Phe Asp Leu Asn
            180                 185                 190

Ile Pro Pro Ile Pro Glu Phe Ser Met Val Asn Gly Asp Asp Glu Val
        195                 200                 205

Met Ser Pro Met Pro Ala Lys Lys Pro Arg Phe Asp Phe Pro Val Lys
    210                 215                 220

Leu Gln Leu
225
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ttctttccaa gttcttctgt aaatcccaag tcccgctctt ttcctcttta tccttttcac    120

cagcttcgct actaagacaa caaatctttc cctctctctc tcgcctgatc gatcttcaaa    180

gagtaagaaa a atg cag gaa caa gcg act agc tct tta gct gca agc tct      230
             Met Gln Glu Gln Ala Thr Ser Ser Leu Ala Ala Ser Ser
             1               5                   10

tta cca tca agc agc gag agg tca tca agc tct gct cca cat ttg gag      278
Leu Pro Ser Ser Ser Glu Arg Ser Ser Ser Ser Ala Pro His Leu Glu
    15                  20                  25

atc aaa gaa gga att gaa agc gat gag gag ata cgg cga gtg ccg gag      326
Ile Lys Glu Gly Ile Glu Ser Asp Glu Glu Ile Arg Arg Val Pro Glu
30                  35                  40                  45

ttt gga gga gaa gct gtc gga aaa gaa act tcc ggt aga gaa tct gga      374
Phe Gly Gly Glu Ala Val Gly Lys Glu Thr Ser Gly Arg Glu Ser Gly
                50                  55                  60

tcg gcg acc ggt cag gag cgg aca cag gcg act gtc gga gaa agt caa      422
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Ser Ala Thr Gly Gln Glu Arg Thr Gln Ala Thr Val Gly Glu Ser Gln
            65                  70                  75

agg aag cga ggg agg aca ccg gcg gag aaa gag aac aag cgg ctg aag      470
Arg Lys Arg Gly Arg Thr Pro Ala Glu Lys Glu Asn Lys Arg Leu Lys
        80                  85                  90

agg ttg ttg agg aac aga gtt tca gct cag caa gca aga gag agg aaa      518
Arg Leu Leu Arg Asn Arg Val Ser Ala Gln Gln Ala Arg Glu Arg Lys
    95                  100                 105

aag gct tac ttg agc gag ttg gaa aac aga gtg aaa gac ttg gag aac      566
Lys Ala Tyr Leu Ser Glu Leu Glu Asn Arg Val Lys Asp Leu Glu Asn
110                 115                 120                 125

aaa aac tct gaa ctt gaa gag cga ctc tct act ctt cag aac gag aac      614
Lys Asn Ser Glu Leu Glu Glu Arg Leu Ser Thr Leu Gln Asn Glu Asn
                130                 135                 140

cag atg ctt aga cat att ctg aag aac aca aca gga aac aag aga gga      662
Gln Met Leu Arg His Ile Leu Lys Asn Thr Thr Gly Asn Lys Arg Gly
            145                 150                 155

ggt ggt ggt ggt tct aat gct gat gca agc ctt tga tctccttctt          708
Gly Gly Gly Gly Ser Asn Ala Asp Ala Ser Leu
        160                 165

cttcttgtgt tatatttttg tggataaaat ttacagagaa ttgtatcaat aattatcatg    768

ttaaaattat atgggatgtg agagctaata ttgcaattgt agaccaagtt ctcttaaaaa    828

aaaaaaaaaa aaaa                                                     842

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Met Gln Glu Gln Ala Thr Ser Ser Leu Ala Ala Ser Ser Leu Pro Ser
1               5                   10                  15

Ser Ser Glu Arg Ser Ser Ser Ser Ala Pro His Leu Glu Ile Lys Glu
            20                  25                  30

Gly Ile Glu Ser Asp Glu Glu Ile Arg Arg Val Pro Glu Phe Gly Gly
        35                  40                  45

Glu Ala Val Gly Lys Glu Thr Ser Gly Arg Glu Ser Gly Ser Ala Thr
    50                  55                  60

Gly Gln Glu Arg Thr Gln Ala Thr Val Gly Glu Ser Gln Arg Lys Arg
65                  70                  75                  80

Gly Arg Thr Pro Ala Glu Lys Glu Asn Lys Arg Leu Lys Arg Leu Leu
```

```
                85                  90                  95

Arg Asn Arg Val Ser Ala Gln Gln Ala Arg Glu Arg Lys Lys Ala Tyr
            100                 105                 110

Leu Ser Glu Leu Glu Asn Arg Val Lys Asp Leu Glu Asn Lys Asn Ser
        115                 120                 125

Glu Leu Glu Glu Arg Leu Ser Thr Leu Gln Asn Glu Asn Gln Met Leu
    130                 135                 140

Arg His Ile Leu Lys Asn Thr Thr Gly Asn Lys Arg Gly Gly Gly Gly
145                 150                 155                 160

Gly Ser Asn Ala Asp Ala Ser Leu
                165
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<222> (141)..(995) <223> G568

<400> 103

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tctgcgtgta ggatactact agacaattga caaccaaaga ctaaagctgt gttgttggtt    120

cacttctgtt ctcttttcca atg ttg tca tca gct aag cat cag aga aac cat    173
                       Met Leu Ser Ser Ala Lys His Gln Arg Asn His
                       1               5                   10

aga ctc tct gct aca aac aag aac cag act ctc acc aaa gtt tct tcc      221
Arg Leu Ser Ala Thr Asn Lys Asn Gln Thr Leu Thr Lys Val Ser Ser
            15                  20                  25

att tca tcc tca tca cca tcg tct tct tct tca tca tca tca acc tca      269
Ile Ser Ser Ser Ser Pro Ser Ser Ser Ser Ser Ser Ser Ser Thr Ser
        30                  35                  40

tca tca tct cct tta cct tct caa gac tct caa gcc cag aag aga tct      317
Ser Ser Ser Pro Leu Pro Ser Gln Asp Ser Gln Ala Gln Lys Arg Ser
    45                  50                  55

ctt gtc acc atg gaa gaa gtt tgg aat gac atc aac ctt gct tcc atc      365
Leu Val Thr Met Glu Glu Val Trp Asn Asp Ile Asn Leu Ala Ser Ile
60                  65                  70                  75

cac cac cta aac cga cac agc cct cat cca caa cac aac cac gag cca      413
His His Leu Asn Arg His Ser Pro His Pro Gln His Asn His Glu Pro
                80                  85                  90

agg ttc agg ggc caa aac cac cac aac caa aac cct aac tca atc ttc      461
Arg Phe Arg Gly Gln Asn His His Asn Gln Asn Pro Asn Ser Ile Phe
```

```
            95                  100                 105

caa gat ttt ctc aaa gga tct ttg aac cag gaa cca gca ccc aca agc      509
Gln Asp Phe Leu Lys Gly Ser Leu Asn Gln Glu Pro Ala Pro Thr Ser
        110                 115                 120

cag acc acg ggt tct gcg cct aat ggc gat tcc acc acg gtc act gtt      557
Gln Thr Thr Gly Ser Ala Pro Asn Gly Asp Ser Thr Thr Val Thr Val
    125                 130                 135

ctt tac agc tct cct ttt cca cct cct gca act gtt ctg agc ttg aat      605
Leu Tyr Ser Ser Pro Phe Pro Pro Pro Ala Thr Val Leu Ser Leu Asn
140                 145                 150                 155

tcc ggc gct ggc ttc gag ttt ctc gat aac caa gat cct ctt gtt acc      653
Ser Gly Ala Gly Phe Glu Phe Leu Asp Asn Gln Asp Pro Leu Val Thr
                160                 165                 170

tca aac tct aat ctt cat acc cac cat cac ctc tca aac gct cat gcc      701
Ser Asn Ser Asn Leu His Thr His His His Leu Ser Asn Ala His Ala
            175                 180                 185

ttc aac acc tct ttc gag gct ctg gtt cca tcc agt tct ttt ggt aag      749
Phe Asn Thr Ser Phe Glu Ala Leu Val Pro Ser Ser Ser Phe Gly Lys
        190                 195                 200

aaa aga ggc caa gat tcc aat gaa ggt tca ggg aat aga aga cat aag      797
Lys Arg Gly Gln Asp Ser Asn Glu Gly Ser Gly Asn Arg Arg His Lys
    205                 210                 215

cgt atg atc aag aac aga gaa tct gca gct cgt tcc cgc gct agg aaa      845
Arg Met Ile Lys Asn Arg Glu Ser Ala Ala Arg Ser Arg Ala Arg Lys
220                 225                 230                 235

cag gct tat aca aac gag tta gaa ctt gaa gtt gct cac ttg cag gca      893
Gln Ala Tyr Thr Asn Glu Leu Glu Leu Glu Val Ala His Leu Gln Ala
                240                 245                 250

gaa aat gca aga ctc aag aga caa caa gat caa aaa atg gct gca gca      941
Glu Asn Ala Arg Leu Lys Arg Gln Gln Asp Gln Lys Met Ala Ala Ala
            255                 260                 265

att cag caa ccc aaa aag aac aca ctt caa cgg tct tcc aca gct cca      989
Ile Gln Gln Pro Lys Lys Asn Thr Leu Gln Arg Ser Ser Thr Ala Pro
        270                 275                 280

ttt tga gaaatctaca agtccttgtt tctcttttgg ggattgagat tgtctcatga      1045
Phe

agaagtgaaa aaatggcaaa agtttgtacc ctttttttatt agctataagt ataactaagc   1105

ctaaaattgt agaactaaga tattgtaggg gaaaaaagaa gatgtaaaac aaaagacccg   1165

gaaagagaaa aggatctttc aatttcctaa ggcacaggaa cacctgtcct gggtcctctc   1225

ttaatgttct gtcgttttcc tatgcaaacc ctttttttcac ttctgtacta acttatactt   1285
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gtattcttg 1294

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Met Leu Ser Ser Ala Lys His Gln Arg Asn His Arg Leu Ser Ala Thr
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Asn Lys Asn Gln Thr Leu Thr Lys Val Ser Ser Ile Ser Ser Ser Ser
20 25 30

Pro Ser Ser Ser Ser Ser Ser Ser Ser Thr Ser Ser Ser Ser Pro Leu
35 40 45

Pro Ser Gln Asp Ser Gln Ala Gln Lys Arg Ser Leu Val Thr Met Glu
50 55 60

Glu Val Trp Asn Asp Ile Asn Leu Ala Ser Ile His His Leu Asn Arg
65 70 75 80

His Ser Pro His Pro Gln His Asn His Glu Pro Arg Phe Arg Gly Gln
85 90 95

Asn His His Asn Gln Asn Pro Asn Ser Ile Phe Gln Asp Phe Leu Lys
100 105 110

Gly Ser Leu Asn Gln Glu Pro Ala Pro Thr Ser Gln Thr Thr Gly Ser
115 120 125

Ala Pro Asn Gly Asp Ser Thr Thr Val Thr Val Leu Tyr Ser Ser Pro
130 135 140

Phe Pro Pro Pro Ala Thr Val Leu Ser Leu Asn Ser Gly Ala Gly Phe
145 150 155 160

Glu Phe Leu Asp Asn Gln Asp Pro Leu Val Thr Ser Asn Ser Asn Leu
165 170 175

His Thr His His His Leu Ser Asn Ala His Ala Phe Asn Thr Ser Phe
180 185 190

Glu Ala Leu Val Pro Ser Ser Ser Phe Gly Lys Lys Arg Gly Gln Asp
195 200 205

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Ser Asn Glu Gly Ser Gly Asn Arg Arg His Lys Arg Met Ile Lys Asn
    210                 215                 220

Arg Glu Ser Ala Ala Arg Ser Arg Ala Arg Lys Gln Ala Tyr Thr Asn
225                 230                 235                 240

Glu Leu Glu Leu Glu Val Ala His Leu Gln Ala Glu Asn Ala Arg Leu
                245                 250                 255

Lys Arg Gln Gln Asp Gln Lys Met Ala Ala Ala Ile Gln Gln Pro Lys
            260                 265                 270

Lys Asn Thr Leu Gln Arg Ser Ser Thr Ala Pro Phe
        275                 280
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<222> (43)..(747) <223> G580

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                                               Met Leu Ser Ser
                                               1

gca aag cat aat aag atc aac aac cat agt gcc ttt tca att tcc tct      102
Ala Lys His Asn Lys Ile Asn Asn His Ser Ala Phe Ser Ile Ser Ser
5                   10                  15                  20

tca tca tca tca tta tca aca tca tcc tcc cta ggc cat aac aaa tct      150
Ser Ser Ser Ser Leu Ser Thr Ser Ser Ser Leu Gly His Asn Lys Ser
                25                  30                  35

caa gtc acc atg gaa gaa gta tgg aaa gaa atc aac ctt ggt tca ctt      198
Gln Val Thr Met Glu Glu Val Trp Lys Glu Ile Asn Leu Gly Ser Leu
            40                  45                  50

cac tac cat cgg caa cta aac att ggt cat gaa cca atg tta aag aac      246
His Tyr His Arg Gln Leu Asn Ile Gly His Glu Pro Met Leu Lys Asn
        55                  60                  65

caa aac cct aat aac tcc atc ttt caa gat ttc ctc aac atg cct ctg      294
Gln Asn Pro Asn Asn Ser Ile Phe Gln Asp Phe Leu Asn Met Pro Leu
    70                  75                  80

aat caa cca cca cca cca cca cca cca cct tcc tct tcc acc att gtc      342
Asn Gln Pro Pro Pro Pro Pro Pro Pro Pro Ser Ser Ser Thr Ile Val
85                  90                  95                  100

act gct ctc tat ggc tct ctg cct ctt ccg cct cct gcc act gtc ctc      390
Thr Ala Leu Tyr Gly Ser Leu Pro Leu Pro Pro Pro Ala Thr Val Leu
                105                 110                 115
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agc tta aac tcc ggt gtt gga ttc gag ttt ctt gat acc aca gaa aat 438
Ser Leu Asn Ser Gly Val Gly Phe Glu Phe Leu Asp Thr Thr Glu Asn
120 125 130

ctt ctt gct tct aac cct cgc tcc ttt gag gaa tct gca aag ttt ggt 486
Leu Leu Ala Ser Asn Pro Arg Ser Phe Glu Glu Ser Ala Lys Phe Gly
135 140 145

tgt ctt ggt aag aaa aga ggc caa gat tct gat gat act aga gga gac 534
Cys Leu Gly Lys Lys Arg Gly Gln Asp Ser Asp Asp Thr Arg Gly Asp
150 155 160

aga agg tat aag cgt atg atc aag aac aga gaa tct gct gct cgt tca 582
Arg Arg Tyr Lys Arg Met Ile Lys Asn Arg Glu Ser Ala Ala Arg Ser
165 170 175 180

agg gct agg aag cag gca tat aca aac gaa ctt gag ctt gaa att gct 630
Arg Ala Arg Lys Gln Ala Tyr Thr Asn Glu Leu Glu Leu Glu Ile Ala
185 190 195

cac ttg cag aca gag aat gca aga ctc aag ata caa caa gag cag ctg 678
His Leu Gln Thr Glu Asn Ala Arg Leu Lys Ile Gln Gln Glu Gln Leu
200 205 210

aaa ata gcc gaa gca act caa aac caa gta aag aaa aca cta caa cgg 726
Lys Ile Ala Glu Ala Thr Gln Asn Gln Val Lys Lys Thr Leu Gln Arg
215 220 225

tct tcc aca gct cca ttt tga gaaaaatcta ctatttcttt ttgggggagt 777
Ser Ser Thr Ala Pro Phe
230

ttcaagtgtt tcttatgaag atgagaaaaa cagaaaaagt ttgtacattt tagctaagtt 837

aaatttgtgg tggtaagtaa tgtaaaagaa aagtgtgtgt agaagaaaag tgtctagaaa 897

aagaaagcaa ctaactttct tcttcttctc tggtttccta tcaactcttt tgacttttgt 957

actttttttc ttctctactt aacctctatt attgtaatgc caagtcaagt ccttatctag 1017

ctagtacatg agtttctgtt ttcactggtt aagccat 1054

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Ser Ile Ser Ser Ser Ser Ser Ser Leu Ser Thr Ser Ser Ser Leu Gly
20 25 30

His Asn Lys Ser Gln Val Thr Met Glu Glu Val Trp Lys Glu Ile Asn
35 40 45

Leu Gly Ser Leu His Tyr His Arg Gln Leu Asn Ile Gly His Glu Pro
50 55 60

Met Leu Lys Asn Gln Asn Pro Asn Asn Ser Ile Phe Gln Asp Phe Leu
65 70 75 80

Asn Met Pro Leu Asn Gln Pro Pro Pro Pro Pro Pro Pro Pro Ser Ser
85 90 95

Ser Thr Ile Val Thr Ala Leu Tyr Gly Ser Leu Pro Leu Pro Pro Pro
100 105 110

Ala Thr Val Leu Ser Leu Asn Ser Gly Val Gly Phe Glu Phe Leu Asp
115 120 125

Thr Thr Glu Asn Leu Leu Ala Ser Asn Pro Arg Ser Phe Glu Glu Ser
130 135 140

Ala Lys Phe Gly Cys Leu Gly Lys Lys Arg Gly Gln Asp Ser Asp Asp
145 150 155 160

Thr Arg Gly Asp Arg Arg Tyr Lys Arg Met Ile Lys Asn Arg Glu Ser
165 170 175

Ala Ala Arg Ser Arg Ala Arg Lys Gln Ala Tyr Thr Asn Glu Leu Glu
180 185 190

Leu Glu Ile Ala His Leu Gln Thr Glu Asn Ala Arg Leu Lys Ile Gln
195 200 205

Gln Glu Gln Leu Lys Ile Ala Glu Ala Thr Gln Asn Gln Val Lys Lys
210 215 220

Thr Leu Gln Arg Ser Ser Thr Ala Pro Phe
225 230

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<222> (102)..(1223) <223> G590

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aatgttttag ctttaactgc ttttttttttg ttgttggtgt a atg ata tca cag aga 116
Met Ile Ser Gln Arg
1 5

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gaa gaa aga gaa gag aag aag cag aga gtg atg gga gat aag aaa ttg      164
Glu Glu Arg Glu Glu Lys Lys Gln Arg Val Met Gly Asp Lys Lys Leu
                10                  15                  20

att tca tct tct tct tct tcc tcg gtt tac gat act cgt atc aat cat      212
Ile Ser Ser Ser Ser Ser Ser Ser Val Tyr Asp Thr Arg Ile Asn His
            25                  30                  35

cat ctt cat cat cct ccg tct tct tcc gac gaa atc tct cag ttt ctc      260
His Leu His His Pro Pro Ser Ser Ser Asp Glu Ile Ser Gln Phe Leu
        40                  45                  50

cgg cat att ttc gac cgt tct tct cct tta cct tct tac tac tcc ccg      308
Arg His Ile Phe Asp Arg Ser Ser Pro Leu Pro Ser Tyr Tyr Ser Pro
    55                  60                  65

gcg acg act aca acg acg gcg tct ttg att ggt gtg cac ggg agc ggt      356
Ala Thr Thr Thr Thr Thr Ala Ser Leu Ile Gly Val His Gly Ser Gly
70                  75                  80                  85

gac cca cat gca gat aac tcg aga agt ctc gtt tct cat cat cca ccg      404
Asp Pro His Ala Asp Asn Ser Arg Ser Leu Val Ser His His Pro Pro
                90                  95                  100

tca gat tct gtg ctt atg tcg aaa cgt gtc gga gat ttc tct gag gtt      452
Ser Asp Ser Val Leu Met Ser Lys Arg Val Gly Asp Phe Ser Glu Val
            105                 110                 115

tta atc ggc gga gga tca ggc tca gcc gcc gcg tgt ttt ggt ttc tcc      500
Leu Ile Gly Gly Gly Ser Gly Ser Ala Ala Ala Cys Phe Gly Phe Ser
        120                 125                 130

ggt ggt ggt aat aat aac aac gtt caa gga aat agc tct ggg act cga      548
Gly Gly Gly Asn Asn Asn Asn Val Gln Gly Asn Ser Ser Gly Thr Arg
    135                 140                 145

gta tcg tct tct tcc gtt gga gct agt ggc aac gag aca gat gag tat      596
Val Ser Ser Ser Ser Val Gly Ala Ser Gly Asn Glu Thr Asp Glu Tyr
150                 155                 160                 165

gac tgt gaa agc gag gaa gga gga gaa gct gta gtt gat gaa gct ccc      644
Asp Cys Glu Ser Glu Glu Gly Gly Glu Ala Val Val Asp Glu Ala Pro
                170                 175                 180

tct tcc aag tca ggt cct tct tct cgt agt tca tct aaa aga tgc aga      692
Ser Ser Lys Ser Gly Pro Ser Ser Arg Ser Ser Ser Lys Arg Cys Arg
            185                 190                 195

gct gct gaa gtt cat aat ctc tct gag aag agg agg aga agt aga att      740
Ala Ala Glu Val His Asn Leu Ser Glu Lys Arg Arg Arg Ser Arg Ile
        200                 205                 210

aat gaa aaa atg aaa gct tta caa agt ctc atc cct aat tca aat aag      788
Asn Glu Lys Met Lys Ala Leu Gln Ser Leu Ile Pro Asn Ser Asn Lys
    215                 220                 225
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acg gat aag gct tca atg ctt gat gaa gcc att gag tat ctg aaa cag      836
Thr Asp Lys Ala Ser Met Leu Asp Glu Ala Ile Glu Tyr Leu Lys Gln
230                 235                 240                 245

ctt cag ctc caa gtt cag atg ttg act atg aga aat gga ata aac ttg      884
Leu Gln Leu Gln Val Gln Met Leu Thr Met Arg Asn Gly Ile Asn Leu
                250                 255                 260

cat cct ttg tgt tta cct gga act aca tta cac cca ttg caa ctc tct      932
His Pro Leu Cys Leu Pro Gly Thr Thr Leu His Pro Leu Gln Leu Ser
            265                 270                 275

cag att cga ccc cct gaa gca acc aat gat cct ctg ctt aat cat acc      980
Gln Ile Arg Pro Pro Glu Ala Thr Asn Asp Pro Leu Leu Asn His Thr
        280                 285                 290

aat cag ttt gct tcg act tct aat gca ccg gaa atg atc aat act gtg     1028
Asn Gln Phe Ala Ser Thr Ser Asn Ala Pro Glu Met Ile Asn Thr Val
    295                 300                 305

gct tct tca tac gct ttg gaa cct tct att cgc agt cac ttt gga cct     1076
Ala Ser Ser Tyr Ala Leu Glu Pro Ser Ile Arg Ser His Phe Gly Pro
310                 315                 320                 325

ttc cct ctc ctt act tca ccc gtg gag atg agt cgg gaa ggt ggg tta     1124
Phe Pro Leu Leu Thr Ser Pro Val Glu Met Ser Arg Glu Gly Gly Leu
                330                 335                 340

act cat cca agg ttg aac att ggt cat tcc aac gca aac ata acc ggg     1172
Thr His Pro Arg Leu Asn Ile Gly His Ser Asn Ala Asn Ile Thr Gly
            345                 350                 355

gaa caa gct ctg ttt gat gga caa cct gac cta aaa gat cga att act     1220
Glu Gln Ala Leu Phe Asp Gly Gln Pro Asp Leu Lys Asp Arg Ile Thr
        360                 365                 370

tga acagtgtccc aacttcggga tctctatgtg ttcttgtttc ttagaacgca          1273

agccataaag ctgtctgac                                               1292
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Replacement Sheet

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Gly Asp Lys Lys Leu Ile Ser Ser Ser Ser Ser Ser Ser Val Tyr Asp
            20                  25                  30

Thr Arg Ile Asn His His Leu His His Pro Pro Ser Ser Ser Asp Glu
        35                  40                  45

Ile Ser Gln Phe Leu Arg His Ile Phe Asp Arg Ser Ser Pro Leu Pro
    50                  55                  60
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Ser Tyr Tyr Ser Pro Ala Thr Thr Thr Thr Thr Ala Ser Leu Ile Gly
65 70 75 80

Val His Gly Ser Gly Asp Pro His Ala Asp Asn Ser Arg Ser Leu Val
85 90 95

Ser His His Pro Pro Ser Asp Ser Val Leu Met Ser Lys Arg Val Gly
100 105 110

Asp Phe Ser Glu Val Leu Ile Gly Gly Gly Ser Gly Ser Ala Ala Ala
115 120 125

Cys Phe Gly Phe Ser Gly Gly Gly Asn Asn Asn Asn Val Gln Gly Asn
130 135 140

Ser Ser Gly Thr Arg Val Ser Ser Ser Ser Val Gly Ala Ser Gly Asn
145 150 155 160

Glu Thr Asp Glu Tyr Asp Cys Glu Ser Glu Glu Gly Gly Glu Ala Val
165 170 175

Val Asp Glu Ala Pro Ser Ser Lys Ser Gly Pro Ser Ser Arg Ser Ser
180 185 190

Ser Lys Arg Cys Arg Ala Ala Glu Val His Asn Leu Ser Glu Lys Arg
195 200 205

Arg Arg Ser Arg Ile Asn Glu Lys Met Lys Ala Leu Gln Ser Leu Ile
210 215 220

Pro Asn Ser Asn Lys Thr Asp Lys Ala Ser Met Leu Asp Glu Ala Ile
225 230 235 240

Glu Tyr Leu Lys Gln Leu Gln Leu Gln Val Gln Met Leu Thr Met Arg
245 250 255

Asn Gly Ile Asn Leu His Pro Leu Cys Leu Pro Gly Thr Thr Leu His
260 265 270

Pro Leu Gln Leu Ser Gln Ile Arg Pro Pro Glu Ala Thr Asn Asp Pro
275 280 285

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Leu Leu Asn His Thr Asn Gln Phe Ala Ser Thr Ser Asn Ala Pro Glu
    290                 295                 300

Met Ile Asn Thr Val Ala Ser Ser Tyr Ala Leu Glu Pro Ser Ile Arg
305                 310                 315                 320

Ser His Phe Gly Pro Phe Pro Leu Leu Thr Ser Pro Val Glu Met Ser
                325                 330                 335

Arg Glu Gly Gly Leu Thr His Pro Arg Leu Asn Ile Gly His Ser Asn
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Ala Asn Ile Thr Gly Glu Gln Ala Leu Phe Asp Gly Gln Pro Asp Leu
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Lys Asp Arg Ile Thr
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Patent Application Publication

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Val Leu Asp Arg Leu Lys Trp Leu Gln Gln Gln Gln Met Val Ser Pro
5                   10                  15                  20

gag ttt ctt cag ata ctt ggc tca gat ggg aga gaa gag ctc aaa aga      153
Glu Phe Leu Gln Ile Leu Gly Ser Asp Gly Arg Glu Glu Leu Lys Arg
                25                  30                  35

gtt gag agt tac ttg gga aac aac aat gat gag ctg cag agt ttc aga      201
Val Glu Ser Tyr Leu Gly Asn Asn Asn Asp Glu Leu Gln Ser Phe Arg
            40                  45                  50

cat ttt ccc gaa ttc gga ccg gat tat gat act act gat ggc tgc att      249
His Phe Pro Glu Phe Gly Pro Asp Tyr Asp Thr Thr Asp Gly Cys Ile
        55                  60                  65

tct agg aca agt agc ttc cat atg gag cca gtg aag aat aat gga cac      297
Ser Arg Thr Ser Ser Phe His Met Glu Pro Val Lys Asn Asn Gly His
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agc aga gcc att acc ttg cag aac aag aga aaa cca gag ggt aag aca      345
Ser Arg Ala Ile Thr Leu Gln Asn Lys Arg Lys Pro Glu Gly Lys Thr
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                105                 110                 115

agc atg aaa ggg aaa tca aac atg agt aac aca gag aca tct tca gaa      441
Ser Met Lys Gly Lys Ser Asn Met Ser Asn Thr Glu Thr Ser Ser Glu
            120                 125                 130

att cag aaa cca gat tac att cat gtt agg gct aga cga ggt gaa gcc      489
Ile Gln Lys Pro Asp Tyr Ile His Val Arg Ala Arg Arg Gly Glu Ala
        135                 140                 145

acc gac aga cat agc tta gca gag agg gca aga aga gaa aag ata agc      537
Thr Asp Arg His Ser Leu Ala Glu Arg Ala Arg Arg Glu Lys Ile Ser
    150                 155                 160

aag aag atg aaa tgt cta caa gat att gtt cct gga tgc aac aaa gtt      585
Lys Lys Met Lys Cys Leu Gln Asp Ile Val Pro Gly Cys Asn Lys Val
165                 170                 175                 180

act gga aaa gct ggt atg ctt gat gag atc atc aac tat gtc caa tct      633
Thr Gly Lys Ala Gly Met Leu Asp Glu Ile Ile Asn Tyr Val Gln Ser
                185                 190                 195

ctg caa caa caa gtc gag ttc ttg tcg atg aaa ctc tct gtc ata aat      681
Leu Gln Gln Gln Val Glu Phe Leu Ser Met Lys Leu Ser Val Ile Asn
            200                 205                 210

cca gaa ctt gag tgt cat atc gat gat tta tcc gca aaa cag ttt cag      729
Pro Glu Leu Glu Cys His Ile Asp Asp Leu Ser Ala Lys Gln Phe Gln
        215                 220                 225

gct tac ttc aca ggt cct cca gaa ggt gac tcg aag cag tca atc atg      777
Ala Tyr Phe Thr Gly Pro Pro Glu Gly Asp Ser Lys Gln Ser Ile Met
    230                 235                 240

gcg gat ttt cgg tct ttt cca tta cat cag caa gga tct tta gat tac      825
Ala Asp Phe Arg Ser Phe Pro Leu His Gln Gln Gly Ser Leu Asp Tyr
245                 250                 255                 260

tca gtc ata aac tca gac cac acc aca tct ctc ggc gct aaa gat cat      873
Ser Val Ile Asn Ser Asp His Thr Thr Ser Leu Gly Ala Lys Asp His
                265                 270                 275

aca tca tca agc tgg gaa act cac tca cag tgt ctt tac aac agc ttg      921
Thr Ser Ser Ser Trp Glu Thr His Ser Gln Cys Leu Tyr Asn Ser Leu
            280                 285                 290

aga acc gat tct gtt tcc aat ttc ttc agc ctc aag taa aaaaattagg       970
Arg Thr Asp Ser Val Ser Asn Phe Phe Ser Leu Lys
        295                 300

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tctgaaattt gaaccagaaa gacagaggaa accaatccaa agatctttct caatctatta   1090

tcttcataca aatatagtga tttacatata ttccagggga tatgtatatg tgtagaagaa   1150
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Glu Leu Lys Arg Val Glu Ser Tyr Leu Gly Asn Asn Asn Asp Glu Leu
35 40 45

Gln Ser Phe Arg His Phe Pro Glu Phe Gly Pro Asp Tyr Asp Thr Thr
50 55 60

Asp Gly Cys Ile Ser Arg Thr Ser Ser Phe His Met Glu Pro Val Lys
65 70 75 80

Asn Asn Gly His Ser Arg Ala Ile Thr Leu Gln Asn Lys Arg Lys Pro
85 90 95

Glu Gly Lys Thr Glu Lys Arg Glu Lys Lys Lys Ile Lys Ala Glu Asp
100 105 110

Glu Thr Glu Pro Ser Met Lys Gly Lys Ser Asn Met Ser Asn Thr Glu
115 120 125

Thr Ser Ser Glu Ile Gln Lys Pro Asp Tyr Ile His Val Arg Ala Arg
130 135 140

Arg Gly Glu Ala Thr Asp Arg His Ser Leu Ala Glu Arg Ala Arg Arg
145 150 155 160

Glu Lys Ile Ser Lys Lys Met Lys Cys Leu Gln Asp Ile Val Pro Gly
165 170 175

Cys Asn Lys Val Thr Gly Lys Ala Gly Met Leu Asp Glu Ile Ile Asn
180 185 190

Application Number 2004255955

Tyr Val Gln Ser Leu Gln Gln Gln Val Glu Phe Leu Ser Met Lys Leu
195 200 205

Ser Val Ile Asn Pro Glu Leu Glu Cys His Ile Asp Asp Leu Ser Ala
210 215 220

Lys Gln Phe Gln Ala Tyr Phe Thr Gly Pro Pro Glu Gly Asp Ser Lys
225 230 235 240

Gln Ser Ile Met Ala Asp Phe Arg Ser Phe Pro Leu His Gln Gln Gly
245 250 255

Ser Leu Asp Tyr Ser Val Ile Asn Ser Asp His Thr Thr Ser Leu Gly
260 265 270

Ala Lys Asp His Thr Ser Ser Ser Trp Glu Thr His Ser Gln Cys Leu
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ctctctctct tcactctctc tttctttcaa a atg gaa aaa ctc atg gtt ccg 172
Met Glu Lys Leu Met Val Pro
1 5

aca tgg aga ccc gac ccg gtt tac cgt cca ccg gaa aca cca ctc gaa 220
Thr Trp Arg Pro Asp Pro Val Tyr Arg Pro Pro Glu Thr Pro Leu Glu
10 15 20

ccg atg gag ttt tta gct cgt tca tgg agc gtc tct gct ctc gaa gtc 268
Pro Met Glu Phe Leu Ala Arg Ser Trp Ser Val Ser Ala Leu Glu Val
25 30 35

tcc aag gct cta aca cca ccc aac cct cag att ctc ctc tcc aaa acc 316
Ser Lys Ala Leu Thr Pro Pro Asn Pro Gln Ile Leu Leu Ser Lys Thr
40 45 50 55

gaa gaa gaa gaa gaa gaa gaa ccc atc tcc tct gtc gta gac ggc gac 364
Glu Glu Glu Glu Glu Glu Glu Pro Ile Ser Ser Val Val Asp Gly Asp
60 65 70

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ggc gac acg gaa gac acc gga ctt gtc acc gga aac cca ttc tcc ttc      412
Gly Asp Thr Glu Asp Thr Gly Leu Val Thr Gly Asn Pro Phe Ser Phe
            75                  80                  85

gct tgt tca gaa act tct caa atg gtc atg gat cgt atc ttg tct cac      460
Ala Cys Ser Glu Thr Ser Gln Met Val Met Asp Arg Ile Leu Ser His
        90                  95                  100

tct caa gaa gta tca cca aga aca tct ggt cgg cta tct cac agt agt      508
Ser Gln Glu Val Ser Pro Arg Thr Ser Gly Arg Leu Ser His Ser Ser
    105                 110                 115

ggt cca ctt aat ggt tct ttg acc gac agt cct cct gtg tct cct ccc      556
Gly Pro Leu Asn Gly Ser Leu Thr Asp Ser Pro Pro Val Ser Pro Pro
120                 125                 130                 135

gaa tcc gac gac att aag caa ttt tgc aga gcg aac aaa aat tca ttg      604
Glu Ser Asp Asp Ile Lys Gln Phe Cys Arg Ala Asn Lys Asn Ser Leu
                140                 145                 150

aac agt gta aat tct cag ttc cgt tca acg gcg gca act ccg gga cct      652
Asn Ser Val Asn Ser Gln Phe Arg Ser Thr Ala Ala Thr Pro Gly Pro
            155                 160                 165

ata acc gct aca gct aca cag tcc aag acg gtg gga cgg tgg ctt aag      700
Ile Thr Ala Thr Ala Thr Gln Ser Lys Thr Val Gly Arg Trp Leu Lys
        170                 175                 180

gac cgg aga gag aaa aag aaa gag gag act cgg gct cat aac gct cag      748
Asp Arg Arg Glu Lys Lys Lys Glu Glu Thr Arg Ala His Asn Ala Gln
    185                 190                 195

att cac gct gct gtc tct gtc gcc ggc gtt gct gca gct gtt gct gct      796
Ile His Ala Ala Val Ser Val Ala Gly Val Ala Ala Ala Val Ala Ala
200                 205                 210                 215

att gca gca gcc acc gct gcg tct tct agc tgt ggt aag gat gag cag      844
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                220                 225                 230

atg gct aaa act gac atg gcc gtt gct tct gct gcg acc ctt gtg gct      892
Met Ala Lys Thr Asp Met Ala Val Ala Ser Ala Ala Thr Leu Val Ala
            235                 240                 245

gct cag tgt gtg gaa gct gct gaa gtt atg gga gct gag aga gag tat      940
Ala Gln Cys Val Glu Ala Ala Glu Val Met Gly Ala Glu Arg Glu Tyr
        250                 255                 260

ttg gct tct gtt gtt agc tcc gcc gtc aat gtt cgt tct gcc gga gat      988
Leu Ala Ser Val Val Ser Ser Ala Val Asn Val Arg Ser Ala Gly Asp
    265                 270                 275

att atg act ctc acc gcc gga gca gct aca gct tta aga gga gtg caa     1036
Ile Met Thr Leu Thr Ala Gly Ala Ala Thr Ala Leu Arg Gly Val Gln
280                 285                 290                 295

aca ttg aag gca agg gca atg aag gaa gtg tgg aac ata gca tca gtg     1084
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300 305 310

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Ile Pro Met Asp Lys Gly Leu Thr Ser Thr Gly Gly Ser Ser Asn Asn
315 320 325

gtt aat ggt agc aat gga agc tca agc agt agt cac agt ggt gaa ctt 1180
Val Asn Gly Ser Asn Gly Ser Ser Ser Ser Ser His Ser Gly Glu Leu
330 335 340

gta caa cag gag aat ttc ttg gga act tgt agt aga gaa tgg ctc gct 1228
Val Gln Gln Glu Asn Phe Leu Gly Thr Cys Ser Arg Glu Trp Leu Ala
345 350 355

aga ggt tgt gaa ctc ctc aaa cgc act cgc aaa ggt gat ctc cac tgg 1276
Arg Gly Cys Glu Leu Leu Lys Arg Thr Arg Lys Gly Asp Leu His Trp
360 365 370 375

aag ata gta tct gtt tac atc aac aaa atg aat cag gtt atg ttg aag 1324
Lys Ile Val Ser Val Tyr Ile Asn Lys Met Asn Gln Val Met Leu Lys
380 385 390

atg aag agc agg cat gtt gga gga acc ttc acc aag aag aaa aag aac 1372
Met Lys Ser Arg His Val Gly Gly Thr Phe Thr Lys Lys Lys Lys Asn
395 400 405

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Ile Val Leu Asp Val Ile Lys Asn Val Pro Ala Trp Pro Gly Arg His
410 415 420

ttg cta gag gga gga gat gat cta aga tac ttc ggt ttg aag acg gtt 1468
Leu Leu Glu Gly Gly Asp Asp Leu Arg Tyr Phe Gly Leu Lys Thr Val
425 430 435

atg cga ggt gat gtt gaa ttc gag gtc aag agc caa agg gaa tat gaa 1516
Met Arg Gly Asp Val Glu Phe Glu Val Lys Ser Gln Arg Glu Tyr Glu
440 445 450 455

atg tgg aca caa ggt gtc tca agg ctt ctt gtt ctt gct gct gag agg 1564
Met Trp Thr Gln Gly Val Ser Arg Leu Leu Val Leu Ala Ala Glu Arg
460 465 470

aag ttt agg atg tga ataaacgttc aatggctgct tggtttaagt gtgagttttt 1619
Lys Phe Arg Met
475

ttttaactta tgtggtcaaa tttcattagt aggggttctt ttaaggtaat ggtttttttgg 1679

gttgggtata ggataaaatg gacctaccag tcaaggtgag gaagcatttg ggtaaacaaa 1739

acttagtggg ggtgatctgt aatatctatg ttcttagttt ttttttggtt gttggtggtc 1799

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20 25 30

Ser Val Ser Ala Leu Glu Val Ser Lys Ala Leu Thr Pro Pro Asn Pro
35 40 45

Gln Ile Leu Leu Ser Lys Thr Glu Glu Glu Glu Glu Glu Glu Pro Ile
50 55 60

Ser Ser Val Val Asp Gly Asp Gly Asp Thr Glu Asp Thr Gly Leu Val
65 70 75 80

Thr Gly Asn Pro Phe Ser Phe Ala Cys Ser Glu Thr Ser Gln Met Val
85 90 95

Met Asp Arg Ile Leu Ser His Ser Gln Glu Val Ser Pro Arg Thr Ser
100 105 110

Gly Arg Leu Ser His Ser Ser Gly Pro Leu Asn Gly Ser Leu Thr Asp
115 120 125

Ser Pro Pro Val Ser Pro Pro Glu Ser Asp Asp Ile Lys Gln Phe Cys
130 135 140

Arg Ala Asn Lys Asn Ser Leu Asn Ser Val Asn Ser Gln Phe Arg Ser
145 150 155 160

Thr Ala Ala Thr Pro Gly Pro Ile Thr Ala Thr Ala Thr Gln Ser Lys
165 170 175

Thr Val Gly Arg Trp Leu Lys Asp Arg Arg Glu Lys Lys Lys Glu Glu
180 185 190

Thr Arg Ala His Asn Ala Gln Ile His Ala Ala Val Ser Val Ala Gly
195 200 205

Val Ala Ala Ala Val Ala Ala Ile Ala Ala Ala Thr Ala Ala Ser Ser
210 215 220

Ser Cys Gly Lys Asp Glu Gln Met Ala Lys Thr Asp Met Ala Val Ala
225 230 235 240

Ser Ala Ala Thr Leu Val Ala Ala Gln Cys Val Glu Ala Ala Glu Val
245 250 255

Met Gly Ala Glu Arg Glu Tyr Leu Ala Ser Val Val Ser Ser Ala Val
260 265 270

Asn Val Arg Ser Ala Gly Asp Ile Met Thr Leu Thr Ala Gly Ala Ala
275 280 285

Thr Ala Leu Arg Gly Val Gln Thr Leu Lys Ala Arg Ala Met Lys Glu
290 295 300

Val Trp Asn Ile Ala Ser Val Ile Pro Met Asp Lys Gly Leu Thr Ser
305 310 315 320

Thr Gly Gly Ser Ser Asn Asn Val Asn Gly Ser Asn Gly Ser Ser Ser
325 330 335

Ser Ser His Ser Gly Glu Leu Val Gln Gln Glu Asn Phe Leu Gly Thr
340 345 350

Cys Ser Arg Glu Trp Leu Ala Arg Gly Cys Glu Leu Leu Lys Arg Thr
355 360 365

Arg Lys Gly Asp Leu His Trp Lys Ile Val Ser Val Tyr Ile Asn Lys
370 375 380

Met Asn Gln Val Met Leu Lys Met Lys Ser Arg His Val Gly Gly Thr
385 390 395 400

Phe Thr Lys Lys Lys Lys Asn Ile Val Leu Asp Val Ile Lys Asn Val
405 410 415

Pro Ala Trp Pro Gly Arg His Leu Leu Glu Gly Gly Asp Asp Leu Arg
420 425 430

Tyr Phe Gly Leu Lys Thr Val Met Arg Gly Asp Val Glu Phe Glu Val
435 440 445

Lys Ser Gln Arg Glu Tyr Glu Met Trp Thr Gln Gly Val Ser Arg Leu

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1               5                   10                  15

ata aga atc aca acg cgg tgc atg tgg ctt gac aaa gga aga ctt tta       96
Ile Arg Ile Thr Thr Arg Cys Met Trp Leu Asp Lys Gly Arg Leu Leu
            20                  25                  30

gat gca ctt cac aaa gca gct cat gct gct cta tca agt tgt cct gtg      144
Asp Ala Leu His Lys Ala Ala His Ala Ala Leu Ser Ser Cys Pro Val
        35                  40                  45

aca tgt ccc ttg tct cac atg gaa aga aca gtc tcc gaa gtc ctg agg      192
Thr Cys Pro Leu Ser His Met Glu Arg Thr Val Ser Glu Val Leu Arg
    50                  55                  60

aag att gta agg aag tac agt ggt aaa agg cct gaa gtc atc gct ata      240
Lys Ile Val Arg Lys Tyr Ser Gly Lys Arg Pro Glu Val Ile Ala Ile
65                  70                  75                  80

gcc act gag aat cca atg gct gtc cga gct gat gag gtc agt gcg aga      288
Ala Thr Glu Asn Pro Met Ala Val Arg Ala Asp Glu Val Ser Ala Arg
                85                  90                  95

ctg tct ggt gat cca agt gtt ggt tct gga gtt gca gct tta agg aaa      336
Leu Ser Gly Asp Pro Ser Val Gly Ser Gly Val Ala Ala Leu Arg Lys
            100                 105                 110

gtt gtt gaa gga aat gac aaa aga agt cgg gcg aag aaa gca cct tca      384
Val Val Glu Gly Asn Asp Lys Arg Ser Arg Ala Lys Lys Ala Pro Ser
        115                 120                 125

caa gaa gct tcc ccc aaa gaa gta gat cgc act ttg gaa gat gat atc      432
Gln Glu Ala Ser Pro Lys Glu Val Asp Arg Thr Leu Glu Asp Asp Ile
    130                 135                 140

att gat agt gca aga cta ctg gct gaa gaa gaa act gcg gca tca aca      480
Ile Asp Ser Ala Arg Leu Leu Ala Glu Glu Glu Thr Ala Ala Ser Thr
145                 150                 155                 160

tac acg gaa gaa gtt gat acg ccc gtt ggg agt tct tca gaa gag tca      528
Tyr Thr Glu Glu Val Asp Thr Pro Val Gly Ser Ser Ser Glu Glu Ser
                165                 170                 175

gac gat ttt tgg aaa tca ttc atc aat cca tca tcg tca cct tca ccg      576
Asp Asp Phe Trp Lys Ser Phe Ile Asn Pro Ser Ser Ser Pro Ser Pro
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            180                 185                 190

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        195                 200                 205

gag ggt aag gaa aac agc aga gac gac gat gaa tta gct gat gct tca      672
Glu Gly Lys Glu Asn Ser Arg Asp Asp Asp Glu Leu Ala Asp Ala Ser
    210                 215                 220

gat tct gaa acc aag tca tca cca aaa cgt gtg agg aag aac aaa tgg      720
Asp Ser Glu Thr Lys Ser Ser Pro Lys Arg Val Arg Lys Asn Lys Trp
225                 230                 235                 240

aaa ccg gag gag ata aag aag gta atc aga atg cga gga gag ctg cac      768
Lys Pro Glu Glu Ile Lys Lys Val Ile Arg Met Arg Gly Glu Leu His
                245                 250                 255

agt aga ttt caa gtg gtg aaa ggt aga atg gca ttg tgg gaa gag atc      816
Ser Arg Phe Gln Val Val Lys Gly Arg Met Ala Leu Trp Glu Glu Ile
            260                 265                 270

tct tca aat cta tca gct gaa gga atc aat cga agc ccg gga caa tgc      864
Ser Ser Asn Leu Ser Ala Glu Gly Ile Asn Arg Ser Pro Gly Gln Cys
        275                 280                 285

aaa tct ctc tgg gca tca ctt att cag aaa tac gag gag agc aag gct      912
Lys Ser Leu Trp Ala Ser Leu Ile Gln Lys Tyr Glu Glu Ser Lys Ala
    290                 295                 300

gat gag aga agc aag acg agt tgg cca cat ttt gag gat atg aac aac      960
Asp Glu Arg Ser Lys Thr Ser Trp Pro His Phe Glu Asp Met Asn Asn
305                 310                 315                 320

att ttg tca gag cta ggc aca cct gcg tct taa                          993
Ile Leu Ser Glu Leu Gly Thr Pro Ala Ser
                325                 330
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Asp Ala Leu His Lys Ala Ala His Ala Ala Leu Ser Ser Cys Pro Val
        35                  40                  45

Thr Cys Pro Leu Ser His Met Glu Arg Thr Val Ser Glu Val Leu Arg
    50                  55                  60
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Lys Ile Val Arg Lys Tyr Ser Gly Lys Arg Pro Glu Val Ile Ala Ile
65 70 75 80

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85 90 95

Leu Ser Gly Asp Pro Ser Val Gly Ser Gly Val Ala Ala Leu Arg Lys
100 105 110

Val Val Glu Gly Asn Asp Lys Arg Ser Arg Ala Lys Lys Ala Pro Ser
115 120 125

Gln Glu Ala Ser Pro Lys Glu Val Asp Arg Thr Leu Glu Asp Asp Ile
130 135 140

Ile Asp Ser Ala Arg Leu Leu Ala Glu Glu Glu Thr Ala Ala Ser Thr
145 150 155 160

Tyr Thr Glu Glu Val Asp Thr Pro Val Gly Ser Ser Ser Glu Glu Ser
165 170 175

Asp Asp Phe Trp Lys Ser Phe Ile Asn Pro Ser Ser Ser Pro Ser Pro
180 185 190

Ser Glu Thr Glu Asn Met Asn Lys Val Ala Asp Thr Glu Pro Lys Ala
195 200 205

Glu Gly Lys Glu Asn Ser Arg Asp Asp Asp Glu Leu Ala Asp Ala Ser
210 215 220

Asp Ser Glu Thr Lys Ser Ser Pro Lys Arg Val Arg Lys Asn Lys Trp
225 230 235 240

Lys Pro Glu Glu Ile Lys Lys Val Ile Arg Met Arg Gly Glu Leu His
245 250 255

Ser Arg Phe Gln Val Val Lys Gly Arg Met Ala Leu Trp Glu Glu Ile
260 265 270

Ser Ser Asn Leu Ser Ala Glu Gly Ile Asn Arg Ser Pro Gly Gln Cys
275 280 285

Lys Ser Leu Trp Ala Ser Leu Ile Gln Lys Tyr Glu Glu Ser Lys Ala

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    290                 295                 300

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305                 310                 315                 320

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                              Met Asp Gln Asp Gln His Pro Gln Tyr
                              1               5

ggt ata ccg gag ctc cgg cag ctc atg aaa ggc gga gga agg acg act      160
Gly Ile Pro Glu Leu Arg Gln Leu Met Lys Gly Gly Gly Arg Thr Thr
10                  15                  20                  25

act aca aca ccg tct act tct tct cat ttt ccc tct gat ttc ttc ggt      208
Thr Thr Thr Pro Ser Thr Ser Ser His Phe Pro Ser Asp Phe Phe Gly
                30                  35                  40

ttt aac ctt gct ccg gtg cag cca ccg cca cac cgt ctt cat cag ttc      256
Phe Asn Leu Ala Pro Val Gln Pro Pro Pro His Arg Leu His Gln Phe
            45                  50                  55

act act gat caa gat atg ggt ttc ttg cca cgt ggc ata cat gga ttg      304
Thr Thr Asp Gln Asp Met Gly Phe Leu Pro Arg Gly Ile His Gly Leu
        60                  65                  70

ggt gga ggt tct tca acg gct gga aat aac agt aac tta aac gcg agt      352
Gly Gly Gly Ser Ser Thr Ala Gly Asn Asn Ser Asn Leu Asn Ala Ser
    75                  80                  85

act agt ggt gga gga gtt ggg ttt agt ggg ttt ctt gac ggt ggt ggt      400
Thr Ser Gly Gly Gly Val Gly Phe Ser Gly Phe Leu Asp Gly Gly Gly
90                  95                  100                 105

ttc ggc agc gga gta gga gga gac ggt gga gga act gga agg tgg ccg      448
Phe Gly Ser Gly Val Gly Gly Asp Gly Gly Gly Thr Gly Arg Trp Pro
                110                 115                 120

aga caa gaa acc cta act ctg ttg gaa att aga tct cgt ctt gat cat      496
Arg Gln Glu Thr Leu Thr Leu Leu Glu Ile Arg Ser Arg Leu Asp His
            125                 130                 135

aaa ttc aaa gaa gct aat cat aaa gga cct ctt tgg gat gaa gtt tct      544
Lys Phe Lys Glu Ala Asn His Lys Gly Pro Leu Trp Asp Glu Val Ser
        140                 145                 150
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agg att atg tcc gag gaa cat gga tac caa agg agt ggg aag aaa tgc      592
Arg Ile Met Ser Glu Glu His Gly Tyr Gln Arg Ser Gly Lys Lys Cys
    155                 160                 165

aga gag aag ttt gag aat ctg tac aaa tac tat agt aag act aaa gaa      640
Arg Glu Lys Phe Glu Asn Leu Tyr Lys Tyr Tyr Ser Lys Thr Lys Glu
170                 175                 180                 185

ggc gaa gcc gga aga caa gac gga aaa cat cac aga ttt ttc cgc cag      688
Gly Glu Ala Gly Arg Gln Asp Gly Lys His His Arg Phe Phe Arg Gln
                190                 195                 200

ctc caa gcg cta tac ggg gat tct aat aac ttg gtt tct tgt ccc aat      736
Leu Gln Ala Leu Tyr Gly Asp Ser Asn Asn Leu Val Ser Cys Pro Asn
            205                 210                 215

cat aac acg cag ttc atg agc agt gct ctt cat ggt ttc cat act caa      784
His Asn Thr Gln Phe Met Ser Ser Ala Leu His Gly Phe His Thr Gln
        220                 225                 230

aac cct atg aac gtt gct aca aca acg tcc aac atc cat aac gtt gat      832
Asn Pro Met Asn Val Ala Thr Thr Thr Ser Asn Ile His Asn Val Asp
    235                 240                 245

agt gtt cat ggt ttt cat caa agc ctt agt ctt tct aac aac tac aac      880
Ser Val His Gly Phe His Gln Ser Leu Ser Leu Ser Asn Asn Tyr Asn
250                 255                 260                 265

tcc tcc gag ctt gag ctg atg act tcc tct tcg gaa ggg aat gat tct      928
Ser Ser Glu Leu Glu Leu Met Thr Ser Ser Ser Glu Gly Asn Asp Ser
                270                 275                 280

agt agt aga agg aaa aag agg agt tgg aaa gcg aag ata aag gag ttc      976
Ser Ser Arg Arg Lys Lys Arg Ser Trp Lys Ala Lys Ile Lys Glu Phe
            285                 290                 295

att gat acg aac atg aaa agg ttg ata gag agg caa gat gtt tgg ctt     1024
Ile Asp Thr Asn Met Lys Arg Leu Ile Glu Arg Gln Asp Val Trp Leu
        300                 305                 310

gag aag ttg aca aag gtt att gaa gac aaa gag gaa caa cgg atg atg     1072
Glu Lys Leu Thr Lys Val Ile Glu Asp Lys Glu Glu Gln Arg Met Met
    315                 320                 325

aaa gaa gag gaa tgg agg aag att gaa gct gca agg att gat aaa gag     1120
Lys Glu Glu Glu Trp Arg Lys Ile Glu Ala Ala Arg Ile Asp Lys Glu
330                 335                 340                 345

cat ttg ttt tgg gct aaa gag agg gcg agg atg gaa gct agg gat gtt     1168
His Leu Phe Trp Ala Lys Glu Arg Ala Arg Met Glu Ala Arg Asp Val
                350                 355                 360

gcg gtg att gag gca ttg caa tac ttg aca gga aag cca ttg ata aag     1216
Ala Val Ile Glu Ala Leu Gln Tyr Leu Thr Gly Lys Pro Leu Ile Lys
            365                 370                 375

ccg ctg tgt tca tcc ccg gaa gag agg aca aat ggt aat aat gag atc     1264
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Pro Leu Cys Ser Ser Pro Glu Glu Arg Thr Asn Gly Asn Asn Glu Ile
        380                 385                 390

cga aac aat agt gag aca cag aat gag aat gga agc gat caa acg atg     1312
Arg Asn Asn Ser Glu Thr Gln Asn Glu Asn Gly Ser Asp Gln Thr Met
    395                 400                 405

act aac aat gtt tgt gtt aaa gga agt agt agc tgc tgg ggt gag caa     1360
Thr Asn Asn Val Cys Val Lys Gly Ser Ser Ser Cys Trp Gly Glu Gln
410                 415                 420                 425

gag att tta aag ctt atg gag ata aga acg agc atg gac tcg acc ttt     1408
Glu Ile Leu Lys Leu Met Glu Ile Arg Thr Ser Met Asp Ser Thr Phe
                430                 435                 440

caa gag ata tta gga ggg tgc tcg gat gag ttt cta tgg gag gaa atc     1456
Gln Glu Ile Leu Gly Gly Cys Ser Asp Glu Phe Leu Trp Glu Glu Ile
            445                 450                 455

gca gcg aag ttg att cag tta ggg ttt gat cag aga agt gcc tta tta     1504
Ala Ala Lys Leu Ile Gln Leu Gly Phe Asp Gln Arg Ser Ala Leu Leu
        460                 465                 470

tgc aag gaa aag tgg gaa tgg ata agc aat gga atg agg aaa gaa aag     1552
Cys Lys Glu Lys Trp Glu Trp Ile Ser Asn Gly Met Arg Lys Glu Lys
    475                 480                 485

aag caa atc aac aag aaa aga aag gat aat tcg tcc agc tgc ggc gtg     1600
Lys Gln Ile Asn Lys Lys Arg Lys Asp Asn Ser Ser Ser Cys Gly Val
490                 495                 500                 505

tac tac ccg aga aac gaa gaa aat cca atc tac aat aat cga gaa agt     1648
Tyr Tyr Pro Arg Asn Glu Glu Asn Pro Ile Tyr Asn Asn Arg Glu Ser
                510                 515                 520

gga tat aat gat aat gat ccg cat caa atc aac gaa caa ggc aat gta     1696
Gly Tyr Asn Asp Asn Asp Pro His Gln Ile Asn Glu Gln Gly Asn Val
            525                 530                 535

ggt tct tca aca tca aac gca aac gca aac gca aac gta acc act gga     1744
Gly Ser Ser Thr Ser Asn Ala Asn Ala Asn Ala Asn Val Thr Thr Gly
        540                 545                 550

aat ccg agc ggt gca atg gct gct agt aca aac tgc ttc ccg ttc ttc     1792
Asn Pro Ser Gly Ala Met Ala Ala Ser Thr Asn Cys Phe Pro Phe Phe
    555                 560                 565

atg gga gat gga gat cag aat ttg tgg gag agt tat ggt ttg agg ctc     1840
Met Gly Asp Gly Asp Gln Asn Leu Trp Glu Ser Tyr Gly Leu Arg Leu
570                 575                 580                 585

agt aaa gaa gag aat cag taa gtaatttctc ttaatgaaga agaagaaggt        1891
Ser Lys Glu Glu Asn Gln
                590

aatcatgtgg ttaactaatt cttttgagtt agctatatat gagataaacc ttgacttagc   1951
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tattatatgt cacatgctgc ttagaattaa gaaatatttg ttggggctta acgaattata 2011

tatcagcata tataagatga gagtctaaga attatatcaa attaggcttt aaccaacgta 2071

cgattatata ttatgttttc atgtatttat tctgtaagac tttttaatat caatctttct 2131

ctaaa 2136

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Met Asp Gln Asp Gln His Pro Gln Tyr Gly Ile Pro Glu Leu Arg Gln
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Leu Met Lys Gly Gly Gly Arg Thr Thr Thr Thr Thr Pro Ser Thr Ser
20 25 30

Ser His Phe Pro Ser Asp Phe Phe Gly Phe Asn Leu Ala Pro Val Gln
35 40 45

Pro Pro Pro His Arg Leu His Gln Phe Thr Thr Asp Gln Asp Met Gly
50 55 60

Phe Leu Pro Arg Gly Ile His Gly Leu Gly Gly Gly Ser Ser Thr Ala
65 70 75 80

Gly Asn Asn Ser Asn Leu Asn Ala Ser Thr Ser Gly Gly Gly Val Gly
85 90 95

Phe Ser Gly Phe Leu Asp Gly Gly Gly Phe Gly Ser Gly Val Gly Gly
100 105 110

Asp Gly Gly Gly Thr Gly Arg Trp Pro Arg Gln Glu Thr Leu Thr Leu
115 120 125

Leu Glu Ile Arg Ser Arg Leu Asp His Lys Phe Lys Glu Ala Asn His
130 135 140

Lys Gly Pro Leu Trp Asp Glu Val Ser Arg Ile Met Ser Glu Glu His
145 150 155 160

Gly Tyr Gln Arg Ser Gly Lys Lys Cys Arg Glu Lys Phe Glu Asn Leu
165 170 175

Tyr Lys Tyr Tyr Ser Lys Thr Lys Glu Gly Glu Ala Gly Arg Gln Asp
180 185 190

Gly Lys His His Arg Phe Phe Arg Gln Leu Gln Ala Leu Tyr Gly Asp
195 200 205

Ser Asn Asn Leu Val Ser Cys Pro Asn His Asn Thr Gln Phe Met Ser
210 215 220

Ser Ala Leu His Gly Phe His Thr Gln Asn Pro Met Asn Val Ala Thr
225 230 235 240

Thr Thr Ser Asn Ile His Asn Val Asp Ser Val His Gly Phe His Gln
245 250 255

Ser Leu Ser Leu Ser Asn Asn Tyr Asn Ser Ser Glu Leu Glu Leu Met
260 265 270

Thr Ser Ser Ser Glu Gly Asn Asp Ser Ser Ser Arg Arg Lys Lys Arg
275 280 285

Ser Trp Lys Ala Lys Ile Lys Glu Phe Ile Asp Thr Asn Met Lys Arg
290 295 300

Leu Ile Glu Arg Gln Asp Val Trp Leu Glu Lys Leu Thr Lys Val Ile
305 310 315 320

Glu Asp Lys Glu Glu Gln Arg Met Met Lys Glu Glu Glu Trp Arg Lys
325 330 335

Ile Glu Ala Ala Arg Ile Asp Lys Glu His Leu Phe Trp Ala Lys Glu
340 345 350

Arg Ala Arg Met Glu Ala Arg Asp Val Ala Val Ile Glu Ala Leu Gln
355 360 365

Tyr Leu Thr Gly Lys Pro Leu Ile Lys Pro Leu Cys Ser Ser Pro Glu
370 375 380

Glu Arg Thr Asn Gly Asn Asn Glu Ile Arg Asn Asn Ser Glu Thr Gln
385 390 395 400

Asn Glu Asn Gly Ser Asp Gln Thr Met Thr Asn Asn Val Cys Val Lys
405 410 415

Gly Ser Ser Ser Cys Trp Gly Glu Gln Glu Ile Leu Lys Leu Met Glu
420 425 430

Ile Arg Thr Ser Met Asp Ser Thr Phe Gln Glu Ile Leu Gly Gly Cys
435 440 445

Ser Asp Glu Phe Leu Trp Glu Glu Ile Ala Ala Lys Leu Ile Gln Leu
450 455 460

Gly Phe Asp Gln Arg Ser Ala Leu Leu Cys Lys Glu Lys Trp Glu Trp
465 470 475 480

Ile Ser Asn Gly Met Arg Lys Glu Lys Lys Gln Ile Asn Lys Lys Arg
485 490 495

Lys Asp Asn Ser Ser Ser Cys Gly Val Tyr Tyr Pro Arg Asn Glu Glu
500 505 510

Asn Pro Ile Tyr Asn Asn Arg Glu Ser Gly Tyr Asn Asp Asn Asp Pro
515 520 525

His Gln Ile Asn Glu Gln Gly Asn Val Gly Ser Ser Thr Ser Asn Ala
530 535 540

Asn Ala Asn Ala Asn Val Thr Thr Gly Asn Pro Ser Gly Ala Met Ala
545 550 555 560

Ala Ser Thr Asn Cys Phe Pro Phe Phe Met Gly Asp Gly Asp Gln Asn
565 570 575

Leu Trp Glu Ser Tyr Gly Leu Arg Leu Ser Lys Glu Glu Asn Gln
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atg gtg cgg aca ccg tgt tgc aaa gcc gaa cta ggg tta aag aaa gga 108
Met Val Arg Thr Pro Cys Cys Lys Ala Glu Leu Gly Leu Lys Lys Gly
1 5 10 15

gct tgg act ccc gag gaa gat cag aag ctt ctc tct tac ctt aac cgc 156
Ala Trp Thr Pro Glu Glu Asp Gln Lys Leu Leu Ser Tyr Leu Asn Arg

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                20                  25                  30

cac ggt gaa ggt gga tgg cga act ctc ccc gaa aaa gct gga ctc aag      204
His Gly Glu Gly Gly Trp Arg Thr Leu Pro Glu Lys Ala Gly Leu Lys
        35                  40                  45

aga tgc ggc aaa agc tgc aga ctg aga tgg gcc aat tat ctt aga cct      252
Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp Ala Asn Tyr Leu Arg Pro
    50                  55                  60

gac atc aaa aga gga gag ttc act gaa gac gaa gaa cgt tca atc atc      300
Asp Ile Lys Arg Gly Glu Phe Thr Glu Asp Glu Glu Arg Ser Ile Ile
65                  70                  75                  80

tct ctt cac gcc ctt cac ggc aac aaa tgg tct gct ata gct cgt gga      348
Ser Leu His Ala Leu His Gly Asn Lys Trp Ser Ala Ile Ala Arg Gly
                85                  90                  95

cta cca gga aga acc gat aac gag atc aag aac tac tgg aac act cat      396
Leu Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp Asn Thr His
            100                 105                 110

atc aaa aaa cgt ttg atc aag aaa ggt att gat cca gtt aca cac aag      444
Ile Lys Lys Arg Leu Ile Lys Lys Gly Ile Asp Pro Val Thr His Lys
        115                 120                 125

ggc ata acc tcc ggt acc gac aaa tca gaa aac ctc ccg gag aaa caa      492
Gly Ile Thr Ser Gly Thr Asp Lys Ser Glu Asn Leu Pro Glu Lys Gln
    130                 135                 140

aat gtt aat ctg aca act agt gac cat gat ctt gat aat gac aag gcg      540
Asn Val Asn Leu Thr Thr Ser Asp His Asp Leu Asp Asn Asp Lys Ala
145                 150                 155                 160

aag aag aac aac aag aat ttt gga tta tca tcg gct agt ttc ttg aac      588
Lys Lys Asn Asn Lys Asn Phe Gly Leu Ser Ser Ala Ser Phe Leu Asn
                165                 170                 175

aaa gta gct aat agg ttc gga aag aga atc aat cag agt gtt ctg tct      636
Lys Val Ala Asn Arg Phe Gly Lys Arg Ile Asn Gln Ser Val Leu Ser
            180                 185                 190

gag att atc gga agt gga ggc cca ctt gct tct act agt cac act act      684
Glu Ile Ile Gly Ser Gly Gly Pro Leu Ala Ser Thr Ser His Thr Thr
        195                 200                 205

aat act aca act aca agt gtt tcc gtt gac tct gaa tca gtt aag tca      732
Asn Thr Thr Thr Thr Ser Val Ser Val Asp Ser Glu Ser Val Lys Ser
    210                 215                 220

acg agt tct tcc ttc gca cca acc tcg aat ctt ctc tgc cat ggg acc      780
Thr Ser Ser Ser Phe Ala Pro Thr Ser Asn Leu Leu Cys His Gly Thr
225                 230                 235                 240

gtt gca aca aca cca gtt tca tcg aac ttt gac gtt gat ggt aac gtt      828
Val Ala Thr Thr Pro Val Ser Ser Asn Phe Asp Val Asp Gly Asn Val
                245                 250                 255
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aat ctg acg tgt tct tcg tcc acg ttc tct gat tcc tcc gtt aac aat 876
Asn Leu Thr Cys Ser Ser Ser Thr Phe Ser Asp Ser Ser Val Asn Asn
260 265 270

cct cta atg tac tgc gat aat ttc gtt ggt aat aac aac gtt gat gat 924
Pro Leu Met Tyr Cys Asp Asn Phe Val Gly Asn Asn Asn Val Asp Asp
275 280 285

gag gat act atc ggg ttc tcc aca ttt ctg aat gat gaa gat ttc atg 972
Glu Asp Thr Ile Gly Phe Ser Thr Phe Leu Asn Asp Glu Asp Phe Met
290 295 300

atg ttg gag gag tct tgt gtt gaa aac act gcg ttc atg aaa gaa ctt 1020
Met Leu Glu Glu Ser Cys Val Glu Asn Thr Ala Phe Met Lys Glu Leu
305 310 315 320

acg agg ttt ctt cac gag gat gaa aac gac gtc gtt gat gtg acg ccg 1068
Thr Arg Phe Leu His Glu Asp Glu Asn Asp Val Val Asp Val Thr Pro
325 330 335

gtc tat gaa cgt caa gac ttg ttt gac gaa att gat aac tat ttt gga 1116
Val Tyr Glu Arg Gln Asp Leu Phe Asp Glu Ile Asp Asn Tyr Phe Gly
340 345 350

tga gtgaaactca taatcgatga atcccacgtg accatgtcaa tatgatgtct 1169

atggatatgt taccttgatg atgttgatgg taataataat aaataataga tggtgatgat 1229

gaccatgcat gaatcatgaa tgtagttcgt gttgtcacat atgcttgtgt ttttgtgttt 1289

ttttttttg gtctgaagtg tgttgtttcg ttgtaaatgg attataaatg gtgatgtaat 1349

aattataatg ttaaaaaaaa aaaaaaaaaa aaaaa 1384

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Met Val Arg Thr Pro Cys Cys Lys Ala Glu Leu Gly Leu Lys Lys Gly
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Ala Trp Thr Pro Glu Glu Asp Gln Lys Leu Leu Ser Tyr Leu Asn Arg
20 25 30

His Gly Glu Gly Gly Trp Arg Thr Leu Pro Glu Lys Ala Gly Leu Lys
35 40 45

Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp Ala Asn Tyr Leu Arg Pro
50 55 60

Asp Ile Lys Arg Gly Glu Phe Thr Glu Asp Glu Glu Arg Ser Ile Ile
65 70 75 80

Ser Leu His Ala Leu His Gly Asn Lys Trp Ser Ala Ile Ala Arg Gly
85 90 95

Leu Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp Asn Thr His
100 105 110

Ile Lys Lys Arg Leu Ile Lys Lys Gly Ile Asp Pro Val Thr His Lys
115 120 125

Gly Ile Thr Ser Gly Thr Asp Lys Ser Glu Asn Leu Pro Glu Lys Gln
130 135 140

Asn Val Asn Leu Thr Thr Ser Asp His Asp Leu Asp Asn Asp Lys Ala
145 150 155 160

Lys Lys Asn Asn Lys Asn Phe Gly Leu Ser Ser Ala Ser Phe Leu Asn
165 170 175

Lys Val Ala Asn Arg Phe Gly Lys Arg Ile Asn Gln Ser Val Leu Ser
180 185 190

Glu Ile Ile Gly Ser Gly Gly Pro Leu Ala Ser Thr Ser His Thr Thr
195 200 205

Asn Thr Thr Thr Thr Ser Val Ser Val Asp Ser Glu Ser Val Lys Ser
210 215 220

Thr Ser Ser Ser Phe Ala Pro Thr Ser Asn Leu Leu Cys His Gly Thr
225 230 235 240

Val Ala Thr Thr Pro Val Ser Ser Asn Phe Asp Val Asp Gly Asn Val
245 250 255

Asn Leu Thr Cys Ser Ser Ser Thr Phe Ser Asp Ser Ser Val Asn Asn
260 265 270

Pro Leu Met Tyr Cys Asp Asn Phe Val Gly Asn Asn Asn Val Asp Asp
275 280 285

Glu Asp Thr Ile Gly Phe Ser Thr Phe Leu Asn Asp Glu Asp Phe Met
290 295 300

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Met Leu Glu Glu Ser Cys Val Glu Asn Thr Ala Phe Met Lys Glu Leu
305                 310                 315                 320

Thr Arg Phe Leu His Glu Asp Glu Asn Asp Val Val Asp Val Thr Pro
                325                 330                 335

Val Tyr Glu Arg Gln Asp Leu Phe Asp Glu Ile Asp Asn Tyr Phe Gly
            340                 345                 350
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atgataagtc agattgcata cttgtctcct ccatggctac tctcaagggt tttggctgcg    180

gtggattcgt ttggtttctc tagaatctaa agaggttatc acaacggctt tgcaatttga    240

aaactttcat gtttggggag atcaaagatg gtttcttttt tatactttac ttgttagaga    300

ggatttgaag cagcgaatag ctgcaaccgg tcctgtt atg gat act aat aca tct     355
                                        Met Asp Thr Asn Thr Ser
                                        1               5

gga gaa gaa tta tta gct aag gca aga aag cca tat aca ata aca aag      403
Gly Glu Glu Leu Leu Ala Lys Ala Arg Lys Pro Tyr Thr Ile Thr Lys
            10                  15                  20

cag cga gag cga tgg act gag gat gag cat gag agg ttt cta gaa gcc      451
Gln Arg Glu Arg Trp Thr Glu Asp Glu His Glu Arg Phe Leu Glu Ala
        25                  30                  35

ttg agg ctt tat gga aga gct tgg caa cga att gaa gaa cat att ggg      499
Leu Arg Leu Tyr Gly Arg Ala Trp Gln Arg Ile Glu Glu His Ile Gly
    40                  45                  50

aca aag act gct gtt cag atc aga agt cat gca caa aag ttc ttc aca      547
Thr Lys Thr Ala Val Gln Ile Arg Ser His Ala Gln Lys Phe Phe Thr
55                  60                  65                  70

aag ttg gag aaa gag gct gaa gtt aaa ggc atc cct gtt tgc caa gct      595
Lys Leu Glu Lys Glu Ala Glu Val Lys Gly Ile Pro Val Cys Gln Ala
                75                  80                  85

ttg gac ata gaa att ccg cct cct cgt cct aaa cga aaa ccc aat act      643
Leu Asp Ile Glu Ile Pro Pro Pro Arg Pro Lys Arg Lys Pro Asn Thr
            90                  95                  100

cct tat cct cga aaa cct ggg aac aac ggt aca tct tcc tct caa gta      691
Pro Tyr Pro Arg Lys Pro Gly Asn Asn Gly Thr Ser Ser Ser Gln Val
        105                 110                 115
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tca tca gca aaa gat gca aaa ctt gtt tca tcg gcc tct tct tca cag      739
Ser Ser Ala Lys Asp Ala Lys Leu Val Ser Ser Ala Ser Ser Ser Gln
    120                 125                 130

ttg aat cag gcg ttc ttg gat ttg gaa aaa atg ccg ttc tct gag aaa      787
Leu Asn Gln Ala Phe Leu Asp Leu Glu Lys Met Pro Phe Ser Glu Lys
135                 140                 145                 150

aca tca act gga aaa gaa aat caa gat gag aat tgc tcg ggt gtt tct      835
Thr Ser Thr Gly Lys Glu Asn Gln Asp Glu Asn Cys Ser Gly Val Ser
                155                 160                 165

act gtg aac aag tat ccc tta cca acg aaa cag gta agt ggc gac att      883
Thr Val Asn Lys Tyr Pro Leu Pro Thr Lys Gln Val Ser Gly Asp Ile
            170                 175                 180

gaa aca agt aag acc tca act gtg gac aac gcg gtt caa gat gtt ccc      931
Glu Thr Ser Lys Thr Ser Thr Val Asp Asn Ala Val Gln Asp Val Pro
        185                 190                 195

aag aag aac aaa gac aaa gat ggt aac gat ggt act act gtg cac agc      979
Lys Lys Asn Lys Asp Lys Asp Gly Asn Asp Gly Thr Thr Val His Ser
    200                 205                 210

atg caa aac tac cct tgg cat ttc cac gca gat att gtg aac ggg aat     1027
Met Gln Asn Tyr Pro Trp His Phe His Ala Asp Ile Val Asn Gly Asn
215                 220                 225                 230

ata gca aaa tgc cct caa aat cat ccc tca ggt atg gta tct caa gac     1075
Ile Ala Lys Cys Pro Gln Asn His Pro Ser Gly Met Val Ser Gln Asp
                235                 240                 245

ttc atg ttt cat cct atg aga gaa gaa act cac ggg cac gca aat ctt     1123
Phe Met Phe His Pro Met Arg Glu Glu Thr His Gly His Ala Asn Leu
            250                 255                 260

caa gct aca aca gca tct gct act act aca gct tct cat caa gcg ttt     1171
Gln Ala Thr Thr Ala Ser Ala Thr Thr Thr Ala Ser His Gln Ala Phe
        265                 270                 275

cca gct tgt cat tca cag gat gat tac cgt tcg ttt ctc cag ata tca     1219
Pro Ala Cys His Ser Gln Asp Asp Tyr Arg Ser Phe Leu Gln Ile Ser
    280                 285                 290

tct act ttc tcc aat ctt att atg tca act ctc cta cag aat cct gca     1267
Ser Thr Phe Ser Asn Leu Ile Met Ser Thr Leu Leu Gln Asn Pro Ala
295                 300                 305                 310

gct cat gct gca gct aca ttc gct gct tcg gtc tgg cct tat gcg agt     1315
Ala His Ala Ala Ala Thr Phe Ala Ala Ser Val Trp Pro Tyr Ala Ser
                315                 320                 325

gtc ggg aat tct ggt gat tca tca acc cca atg agc tct tct cct cca     1363
Val Gly Asn Ser Gly Asp Ser Ser Thr Pro Met Ser Ser Ser Pro Pro
            330                 335                 340
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agt ata act gcc att gcc gct gct aca gta gct gct gca act gct tgg     1411
Ser Ile Thr Ala Ile Ala Ala Ala Thr Val Ala Ala Ala Thr Ala Trp
        345                 350                 355

tgg gct tct cat gga ctt ctt cct gta tgc gct cca gct cca ata aca     1459
Trp Ala Ser His Gly Leu Leu Pro Val Cys Ala Pro Ala Pro Ile Thr
    360                 365                 370

tgt gtt cca ttc tca act gtt gca gtt cca act cca gca atg act gaa     1507
Cys Val Pro Phe Ser Thr Val Ala Val Pro Thr Pro Ala Met Thr Glu
375                 380                 385                 390

atg gat acc gtt gaa aat act caa ccg ttt gag aaa caa aac aca gct     1555
Met Asp Thr Val Glu Asn Thr Gln Pro Phe Glu Lys Gln Asn Thr Ala
                395                 400                 405

ctg caa gat caa acc ttg gct tcg aaa tct cca gct tca tca tct gat     1603
Leu Gln Asp Gln Thr Leu Ala Ser Lys Ser Pro Ala Ser Ser Ser Asp
            410                 415                 420

gat tca gat gag act gga gta acc aag cta aat gcc gac tca aaa acc     1651
Asp Ser Asp Glu Thr Gly Val Thr Lys Leu Asn Ala Asp Ser Lys Thr
        425                 430                 435

aat gat gat aaa att gag gag gtt gtt gtt act gcc gct gtg cat gac     1699
Asn Asp Asp Lys Ile Glu Glu Val Val Val Thr Ala Ala Val His Asp
    440                 445                 450

tca aac act gcc cag aag aaa aat ctt gtg gac cgc tca tcg tgt ggc     1747
Ser Asn Thr Ala Gln Lys Lys Asn Leu Val Asp Arg Ser Ser Cys Gly
455                 460                 465                 470

tca aat aca cct tca ggg agt gac gca gaa act gat gca tta gat aaa     1795
Ser Asn Thr Pro Ser Gly Ser Asp Ala Glu Thr Asp Ala Leu Asp Lys
                475                 480                 485

atg gag aaa gat aaa gag gat gtg aag gag aca gat gag aat cag cca     1843
Met Glu Lys Asp Lys Glu Asp Val Lys Glu Thr Asp Glu Asn Gln Pro
            490                 495                 500

gat gtt att gag tta aat aac cgt aag att aaa atg aga gac aac aac     1891
Asp Val Ile Glu Leu Asn Asn Arg Lys Ile Lys Met Arg Asp Asn Asn
        505                 510                 515

agc aac aac aat gca act act gat tcg tgg aag gaa gtc tcc gaa gag     1939
Ser Asn Asn Asn Ala Thr Thr Asp Ser Trp Lys Glu Val Ser Glu Glu
    520                 525                 530

ggt cgt ata gcg ttt cag gct ctc ttt gca aga gaa aga ttg cct caa     1987
Gly Arg Ile Ala Phe Gln Ala Leu Phe Ala Arg Glu Arg Leu Pro Gln
535                 540                 545                 550

agc ttt tcg cct cct caa gtg gca gag aat gtg aat aga aaa caa agt     2035
Ser Phe Ser Pro Pro Gln Val Ala Glu Asn Val Asn Arg Lys Gln Ser
                555                 560                 565

gac acg tca atg cca ttg gct cct aat ttc aaa agc cag gat tct tgt     2083
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Asp Thr Ser Met Pro Leu Ala Pro Asn Phe Lys Ser Gln Asp Ser Cys
            570                 575                 580

gct gca gac caa gaa gga gta gta atg atc ggt gtt gga aca tgc aag     2131
Ala Ala Asp Gln Glu Gly Val Val Met Ile Gly Val Gly Thr Cys Lys
        585                 590                 595

agt ctt aaa acg aga cag aca gga ttt aag cca tac aag aga tgt tca     2179
Ser Leu Lys Thr Arg Gln Thr Gly Phe Lys Pro Tyr Lys Arg Cys Ser
    600                 605                 610

atg gaa gtg aaa gag agc caa gtt ggg aac ata aac aat caa agt gat     2227
Met Glu Val Lys Glu Ser Gln Val Gly Asn Ile Asn Asn Gln Ser Asp
615                 620                 625                 630

gaa aaa gtc tgc aaa agg ctt cga ttg gaa gga gaa gct tct aca tga     2275
Glu Lys Val Cys Lys Arg Leu Arg Leu Glu Gly Glu Ala Ser Thr
                635                 640                 645

cagacttgga ggtaaaaaaa aaacatccac atttttatca atatctttaa atctagtgtt   2335

agtagtttgc ttctccaatc tttatgaaag agacttttaa ttttccttcc gaacatttct   2395

ttggtcatgt caggttctgt accatattac cccatgtctt gtctcttgtc tctgtttgtg   2455

tatgctactt gtggtctata tgtcatctgc tactactgtt aattaaccat taagcaatgg   2515

atttgtcttt a                                                       2526


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Met Asp Thr Asn Thr Ser Gly Glu Glu Leu Leu Ala Lys Ala Arg Lys
1               5                   10                  15

Pro Tyr Thr Ile Thr Lys Gln Arg Glu Arg Trp Thr Glu Asp Glu His
            20                  25                  30

Glu Arg Phe Leu Glu Ala Leu Arg Leu Tyr Gly Arg Ala Trp Gln Arg
        35                  40                  45

Ile Glu Glu His Ile Gly Thr Lys Thr Ala Val Gln Ile Arg Ser His
    50                  55                  60

Ala Gln Lys Phe Phe Thr Lys Leu Glu Lys Glu Ala Glu Val Lys Gly
65                  70                  75                  80

Ile Pro Val Cys Gln Ala Leu Asp Ile Glu Ile Pro Pro Pro Arg Pro
                85                  90                  95

Lys Arg Lys Pro Asn Thr Pro Tyr Pro Arg Lys Pro Gly Asn Asn Gly
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            100                 105                 110

Thr Ser Ser Ser Gln Val Ser Ser Ala Lys Asp Ala Lys Leu Val Ser
        115                 120                 125

Ser Ala Ser Ser Ser Gln Leu Asn Gln Ala Phe Leu Asp Leu Glu Lys
    130                 135                 140

Met Pro Phe Ser Glu Lys Thr Ser Thr Gly Lys Glu Asn Gln Asp Glu
145                 150                 155                 160

Asn Cys Ser Gly Val Ser Thr Val Asn Lys Tyr Pro Leu Pro Thr Lys
                165                 170                 175

Gln Val Ser Gly Asp Ile Glu Thr Ser Lys Thr Ser Thr Val Asp Asn
            180                 185                 190

Ala Val Gln Asp Val Pro Lys Lys Asn Lys Asp Lys Asp Gly Asn Asp
        195                 200                 205

Gly Thr Thr Val His Ser Met Gln Asn Tyr Pro Trp His Phe His Ala
    210                 215                 220

Asp Ile Val Asn Gly Asn Ile Ala Lys Cys Pro Gln Asn His Pro Ser
225                 230                 235                 240

Gly Met Val Ser Gln Asp Phe Met Phe His Pro Met Arg Glu Glu Thr
                245                 250                 255

His Gly His Ala Asn Leu Gln Ala Thr Thr Ala Ser Ala Thr Thr Thr
            260                 265                 270

Ala Ser His Gln Ala Phe Pro Ala Cys His Ser Gln Asp Asp Tyr Arg
        275                 280                 285

Ser Phe Leu Gln Ile Ser Ser Thr Phe Ser Asn Leu Ile Met Ser Thr
    290                 295                 300

Leu Leu Gln Asn Pro Ala Ala His Ala Ala Ala Thr Phe Ala Ala Ser
305                 310                 315                 320

Val Trp Pro Tyr Ala Ser Val Gly Asn Ser Gly Asp Ser Ser Thr Pro
                325                 330                 335
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Met Ser Ser Ser Pro Pro Ser Ile Thr Ala Ile Ala Ala Ala Thr Val
340 345 350

Ala Ala Ala Thr Ala Trp Trp Ala Ser His Gly Leu Leu Pro Val Cys
355 360 365

Ala Pro Ala Pro Ile Thr Cys Val Pro Phe Ser Thr Val Ala Val Pro
370 375 380

Thr Pro Ala Met Thr Glu Met Asp Thr Val Glu Asn Thr Gln Pro Phe
385 390 395 400

Glu Lys Gln Asn Thr Ala Leu Gln Asp Gln Thr Leu Ala Ser Lys Ser
405 410 415

Pro Ala Ser Ser Ser Asp Asp Ser Asp Glu Thr Gly Val Thr Lys Leu
420 425 430

Asn Ala Asp Ser Lys Thr Asn Asp Asp Lys Ile Glu Glu Val Val Val
435 440 445

Thr Ala Ala Val His Asp Ser Asn Thr Ala Gln Lys Lys Asn Leu Val
450 455 460

Asp Arg Ser Ser Cys Gly Ser Asn Thr Pro Ser Gly Ser Asp Ala Glu
465 470 475 480

Thr Asp Ala Leu Asp Lys Met Glu Lys Asp Lys Glu Asp Val Lys Glu
485 490 495

Thr Asp Glu Asn Gln Pro Asp Val Ile Glu Leu Asn Asn Arg Lys Ile
500 505 510

Lys Met Arg Asp Asn Asn Ser Asn Asn Asn Ala Thr Thr Asp Ser Trp
515 520 525

Lys Glu Val Ser Glu Glu Gly Arg Ile Ala Phe Gln Ala Leu Phe Ala
530 535 540

Arg Glu Arg Leu Pro Gln Ser Phe Ser Pro Pro Gln Val Ala Glu Asn
545 550 555 560

Val Asn Arg Lys Gln Ser Asp Thr Ser Met Pro Leu Ala Pro Asn Phe
565 570 575

Lys Ser Gln Asp Ser Cys Ala Ala Asp Gln Glu Gly Val Val Met Ile
580 585 590

Gly Val Gly Thr Cys Lys Ser Leu Lys Thr Arg Gln Thr Gly Phe Lys
595 600 605

Pro Tyr Lys Arg Cys Ser Met Glu Val Lys Glu Ser Gln Val Gly Asn
610 615 620

Ile Asn Asn Gln Ser Asp Glu Lys Val Cys Lys Arg Leu Arg Leu Glu
625 630 635 640

Gly Glu Ala Ser Thr
645

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atacggacat aaccgtccgt tgtgtcctgt ttataaagtt ttgctttttt tattttctcc 120

attgatgggt cttttctttc ttctctctct cgtgtttctt tcatggggtt aagactagtg 180

tttaccgcgt gaaggttttt ttttctttct attttctttc atttcctctc cttctacttc 240

ttcttctcca gttctcatct gggttcttca atg gcg agt gtt gaa ggt gat gat 294
Met Ala Ser Val Glu Gly Asp Asp
1 5

gat ttc gga agt tct tcg tca agg tct tat caa gat caa cta tac aca 342
Asp Phe Gly Ser Ser Ser Ser Arg Ser Tyr Gln Asp Gln Leu Tyr Thr
10 15 20

gag cta tgg aaa gtt tgt gca ggt cca tta gtg gaa gtt cct cgt gct 390
Glu Leu Trp Lys Val Cys Ala Gly Pro Leu Val Glu Val Pro Arg Ala
25 30 35 40

caa gag aga gtt ttc tac ttc cct cag ggt cac atg gaa caa ctt gtg 438
Gln Glu Arg Val Phe Tyr Phe Pro Gln Gly His Met Glu Gln Leu Val
45 50 55

gcg tca act aat caa gga atc aat tca gaa gaa ata cct gtt ttt gat 486
Ala Ser Thr Asn Gln Gly Ile Asn Ser Glu Glu Ile Pro Val Phe Asp
60 65 70

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ctt cct cca aag ata ctt tgt cga gtt ctt gat gtc act tta aag gcg      534
Leu Pro Pro Lys Ile Leu Cys Arg Val Leu Asp Val Thr Leu Lys Ala
        75                  80                  85

gag cat gaa aca gat gag gtt tac gct cag atc aca tta caa cca gag      582
Glu His Glu Thr Asp Glu Val Tyr Ala Gln Ile Thr Leu Gln Pro Glu
    90                  95                  100

gaa gat caa agt gaa cca aca agt ctt gat cca cct att gtt gga cca      630
Glu Asp Gln Ser Glu Pro Thr Ser Leu Asp Pro Pro Ile Val Gly Pro
105                 110                 115                 120

act aag caa gag ttt cat tcg ttt gtt aag att tta acg gct tca gat      678
Thr Lys Gln Glu Phe His Ser Phe Val Lys Ile Leu Thr Ala Ser Asp
                125                 130                 135

aca agc act cat ggt gga ttc tct gtt ctt cgt aaa cac gcc act gaa      726
Thr Ser Thr His Gly Gly Phe Ser Val Leu Arg Lys His Ala Thr Glu
            140                 145                 150

tgc ttg cct tct ttg gat atg aca caa gct act cct act caa gaa ctt      774
Cys Leu Pro Ser Leu Asp Met Thr Gln Ala Thr Pro Thr Gln Glu Leu
        155                 160                 165

gtg act aga gat ctt cat ggc ttt gaa tgg agg ttt aag cat ata ttc      822
Val Thr Arg Asp Leu His Gly Phe Glu Trp Arg Phe Lys His Ile Phe
    170                 175                 180

aga gga caa cca cgg agg cat ttg ctt act acg ggt tgg agt aca ttt      870
Arg Gly Gln Pro Arg Arg His Leu Leu Thr Thr Gly Trp Ser Thr Phe
185                 190                 195                 200

gta tcc tcg aaa aga ctt gta gct gga gat gct ttt gtg ttc ttg agg      918
Val Ser Ser Lys Arg Leu Val Ala Gly Asp Ala Phe Val Phe Leu Arg
                205                 210                 215

ggt gag aat ggg gat tta cgg gtt gga gtg aga cga tta gct cgg cat      966
Gly Glu Asn Gly Asp Leu Arg Val Gly Val Arg Arg Leu Ala Arg His
            220                 225                 230

caa agc aca atg cct act tcg gtt att tca agt cag agc atg cat ttg     1014
Gln Ser Thr Met Pro Thr Ser Val Ile Ser Ser Gln Ser Met His Leu
        235                 240                 245

gga gtt ctt gct aca gct tct cat gct gtg cgt aca aca aca atc ttt     1062
Gly Val Leu Ala Thr Ala Ser His Ala Val Arg Thr Thr Thr Ile Phe
    250                 255                 260

gtt gtc ttt tac aag cct agg ata agc caa ttc ata gtt ggg gtg aac     1110
Val Val Phe Tyr Lys Pro Arg Ile Ser Gln Phe Ile Val Gly Val Asn
265                 270                 275                 280

aag tat atg gaa gct ata aag cat gga ttt tct ctc ggt acc cga ttc     1158
Lys Tyr Met Glu Ala Ile Lys His Gly Phe Ser Leu Gly Thr Arg Phe
                285                 290                 295

aga atg agg ttt gaa gga gaa gag tct cct gag aga ata ttt act ggt     1206
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Arg Met Arg Phe Glu Gly Glu Glu Ser Pro Glu Arg Ile Phe Thr Gly
            300                 305                 310

acg att gtg gga agt gga gat cta tct tca caa tgg cca gct tct aaa      1254
Thr Ile Val Gly Ser Gly Asp Leu Ser Ser Gln Trp Pro Ala Ser Lys
        315                 320                 325

tgg agg tca ttg cag gta caa tgg gat gag cca aca aca gtt cag aga      1302
Trp Arg Ser Leu Gln Val Gln Trp Asp Glu Pro Thr Thr Val Gln Arg
    330                 335                 340

cca gat aaa gtc tca cca tgg gag ata gag cct ttc ttg gca act tcc      1350
Pro Asp Lys Val Ser Pro Trp Glu Ile Glu Pro Phe Leu Ala Thr Ser
345                 350                 355                 360

cca att tca act cct gct caa caa cca caa tcg aaa tgc aag cgg tca      1398
Pro Ile Ser Thr Pro Ala Gln Gln Pro Gln Ser Lys Cys Lys Arg Ser
                365                 370                 375

aga ccc atc gag cca tca gtt aaa aca cca gcc cca cct agt ttc ttg      1446
Arg Pro Ile Glu Pro Ser Val Lys Thr Pro Ala Pro Pro Ser Phe Leu
            380                 385                 390

tac agc ctc cct cag agc caa gat tcc att aat gca tcc ctt aaa ctg      1494
Tyr Ser Leu Pro Gln Ser Gln Asp Ser Ile Asn Ala Ser Leu Lys Leu
        395                 400                 405

ttt caa gat cca tca ctt gag aga att tca ggt gga tac tcc tca aac      1542
Phe Gln Asp Pro Ser Leu Glu Arg Ile Ser Gly Gly Tyr Ser Ser Asn
    410                 415                 420

aac agc ttc aaa ccc gag act cct cct cct cca acg aat tgt agc tat      1590
Asn Ser Phe Lys Pro Glu Thr Pro Pro Pro Pro Thr Asn Cys Ser Tyr
425                 430                 435                 440

agg ttg ttt gga ttt gat ctc aca agc aat tct cct gct cca atc cct      1638
Arg Leu Phe Gly Phe Asp Leu Thr Ser Asn Ser Pro Ala Pro Ile Pro
                445                 450                 455

caa gac aag caa ccg atg gat act tgt gga gct gcc aag tgt caa gaa      1686
Gln Asp Lys Gln Pro Met Asp Thr Cys Gly Ala Ala Lys Cys Gln Glu
            460                 465                 470

ccc atc act cca acc tca atg agt gag cag aag aag caa caa aca tca      1734
Pro Ile Thr Pro Thr Ser Met Ser Glu Gln Lys Lys Gln Gln Thr Ser
        475                 480                 485

aga agt cga act aaa gtg caa atg caa ggc att gcg gtt ggt cgt gcg      1782
Arg Ser Arg Thr Lys Val Gln Met Gln Gly Ile Ala Val Gly Arg Ala
    490                 495                 500

gtt gat tta aca ctg ttg aaa tct tac gat gaa ctg att gat gag ctt      1830
Val Asp Leu Thr Leu Leu Lys Ser Tyr Asp Glu Leu Ile Asp Glu Leu
505                 510                 515                 520

gag gag atg ttt gag att caa gga cag ctt ctt gcc cga gac aaa tgg      1878
Glu Glu Met Phe Glu Ile Gln Gly Gln Leu Leu Ala Arg Asp Lys Trp
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                525                 530                 535

atc gtt gtc ttc act gat gat gaa gga gat atg atg ctt gct ggt gat     1926
Ile Val Val Phe Thr Asp Asp Glu Gly Asp Met Met Leu Ala Gly Asp
            540                 545                 550

gat ccg tgg aat gag ttt tgc aag atg gca aag aag ata ttt ata tat     1974
Asp Pro Trp Asn Glu Phe Cys Lys Met Ala Lys Lys Ile Phe Ile Tyr
        555                 560                 565

tcg agc gat gag gtt aag aaa atg aca acg aaa ctg aag att tct tcg     2022
Ser Ser Asp Glu Val Lys Lys Met Thr Thr Lys Leu Lys Ile Ser Ser
    570                 575                 580

tcg tta gag aat gag gaa tat ggt aat gaa tca ttc gaa aat cgt agt     2070
Ser Leu Glu Asn Glu Glu Tyr Gly Asn Glu Ser Phe Glu Asn Arg Ser
585                 590                 595                 600

agg ggg tga gagttttagc tgttaattaa ggttaattcg gcgacgtcgt             2119
Arg Gly

tttagtgcgt aagtgtctaa agacttttt tttagtctgt gtatataaag tcttgtcctc   2179

tttttcatgt caatttttca agttggcgat ttaatatttc ggttttggga cagtggttga   2239

tggggcggtt ttacattttt tatgtgtatg tacttgttcc aaaaccattc aattttcaaa   2299
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Ser Tyr Gln Asp Gln Leu Tyr Thr Glu Leu Trp Lys Val Cys Ala Gly
            20                  25                  30

Pro Leu Val Glu Val Pro Arg Ala Gln Glu Arg Val Phe Tyr Phe Pro
        35                  40                  45

Gln Gly His Met Glu Gln Leu Val Ala Ser Thr Asn Gln Gly Ile Asn
    50                  55                  60

Ser Glu Glu Ile Pro Val Phe Asp Leu Pro Pro Lys Ile Leu Cys Arg
65                  70                  75                  80

Val Leu Asp Val Thr Leu Lys Ala Glu His Glu Thr Asp Glu Val Tyr
                85                  90                  95

Ala Gln Ile Thr Leu Gln Pro Glu Glu Asp Gln Ser Glu Pro Thr Ser
            100                 105                 110
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Leu Asp Pro Pro Ile Val Gly Pro Thr Lys Gln Glu Phe His Ser Phe
115 120 125

Val Lys Ile Leu Thr Ala Ser Asp Thr Ser Thr His Gly Gly Phe Ser
130 135 140

Val Leu Arg Lys His Ala Thr Glu Cys Leu Pro Ser Leu Asp Met Thr
145 150 155 160

Gln Ala Thr Pro Thr Gln Glu Leu Val Thr Arg Asp Leu His Gly Phe
165 170 175

Glu Trp Arg Phe Lys His Ile Phe Arg Gly Gln Pro Arg Arg His Leu
180 185 190

Leu Thr Thr Gly Trp Ser Thr Phe Val Ser Ser Lys Arg Leu Val Ala
195 200 205

Gly Asp Ala Phe Val Phe Leu Arg Gly Glu Asn Gly Asp Leu Arg Val
210 215 220

Gly Val Arg Arg Leu Ala Arg His Gln Ser Thr Met Pro Thr Ser Val
225 230 235 240

Ile Ser Ser Gln Ser Met His Leu Gly Val Leu Ala Thr Ala Ser His
245 250 255

Ala Val Arg Thr Thr Thr Ile Phe Val Val Phe Tyr Lys Pro Arg Ile
260 265 270

Ser Gln Phe Ile Val Gly Val Asn Lys Tyr Met Glu Ala Ile Lys His
275 280 285

Gly Phe Ser Leu Gly Thr Arg Phe Arg Met Arg Phe Glu Gly Glu Glu
290 295 300

Ser Pro Glu Arg Ile Phe Thr Gly Thr Ile Val Gly Ser Gly Asp Leu
305 310 315 320

Ser Ser Gln Trp Pro Ala Ser Lys Trp Arg Ser Leu Gln Val Gln Trp
325 330 335

Asp Glu Pro Thr Thr Val Gln Arg Pro Asp Lys Val Ser Pro Trp Glu
340 345 350

Ile Glu Pro Phe Leu Ala Thr Ser Pro Ile Ser Thr Pro Ala Gln Gln
355 360 365

Pro Gln Ser Lys Cys Lys Arg Ser Arg Pro Ile Glu Pro Ser Val Lys
370 375 380

Thr Pro Ala Pro Pro Ser Phe Leu Tyr Ser Leu Pro Gln Ser Gln Asp
385 390 395 400

Ser Ile Asn Ala Ser Leu Lys Leu Phe Gln Asp Pro Ser Leu Glu Arg
405 410 415

Ile Ser Gly Gly Tyr Ser Ser Asn Asn Ser Phe Lys Pro Glu Thr Pro
420 425 430

Pro Pro Pro Thr Asn Cys Ser Tyr Arg Leu Phe Gly Phe Asp Leu Thr
435 440 445

Ser Asn Ser Pro Ala Pro Ile Pro Gln Asp Lys Gln Pro Met Asp Thr
450 455 460

Cys Gly Ala Ala Lys Cys Gln Glu Pro Ile Thr Pro Thr Ser Met Ser
465 470 475 480

Glu Gln Lys Lys Gln Gln Thr Ser Arg Ser Arg Thr Lys Val Gln Met
485 490 495

Gln Gly Ile Ala Val Gly Arg Ala Val Asp Leu Thr Leu Leu Lys Ser
500 505 510

Tyr Asp Glu Leu Ile Asp Glu Leu Glu Glu Met Phe Glu Ile Gln Gly
515 520 525

Gln Leu Leu Ala Arg Asp Lys Trp Ile Val Val Phe Thr Asp Asp Glu
530 535 540

Gly Asp Met Met Leu Ala Gly Asp Asp Pro Trp Asn Glu Phe Cys Lys
545 550 555 560

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Met Ala Lys Lys Ile Phe Ile Tyr Ser Ser Asp Glu Val Lys Lys Met
                565                 570                 575

Thr Thr Lys Leu Lys Ile Ser Ser Ser Leu Glu Asn Glu Glu Tyr Gly
            580                 585                 590

Asn Glu Ser Phe Glu Asn Arg Ser Arg Gly
        595                 600
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Met Ala Thr Gln Asp Ser Gln Gly Ile Lys Leu Phe Gly Lys Thr Ile
1               5                   10                  15

gca ttt aac act cga aca ata aaa aat gaa gaa gag aca cac ccg ccg       96
Ala Phe Asn Thr Arg Thr Ile Lys Asn Glu Glu Glu Thr His Pro Pro
            20                  25                  30

gag caa gaa gcc aca ata gcc gtt aga tca tca tca tca tcg gat ctg      144
Glu Gln Glu Ala Thr Ile Ala Val Arg Ser Ser Ser Ser Ser Asp Leu
        35                  40                  45

acg gcc gag aag cgt ccg gat aag atc ata gca tgt cca aga tgc aag      192
Thr Ala Glu Lys Arg Pro Asp Lys Ile Ile Ala Cys Pro Arg Cys Lys
    50                  55                  60

agc atg gag aca aag ttc tgt tac ttc aac aac tac aac ggt aat cag      240
Ser Met Glu Thr Lys Phe Cys Tyr Phe Asn Asn Tyr Asn Gly Asn Gln
65                  70                  75                  80

cct cga cac ttt tgt aaa ggc tgc cac cgt tac tgg acc gcc ggt ggt      288
Pro Arg His Phe Cys Lys Gly Cys His Arg Tyr Trp Thr Ala Gly Gly
                85                  90                  95

gca ctc cgg aac gtt ccc gtc ggc gcc ggt cgt cgg aag tcc aaa cca      336
Ala Leu Arg Asn Val Pro Val Gly Ala Gly Arg Arg Lys Ser Lys Pro
            100                 105                 110

cct ggt cgt gtc gtg gtt ggt atg ctt gga gat gga aat ggt gtt cgc      384
Pro Gly Arg Val Val Val Gly Met Leu Gly Asp Gly Asn Gly Val Arg
        115                 120                 125

caa gtc gag ctt ata aat ggc ttg ctc gtt gag gag tgg cag cat gcc      432
Gln Val Glu Leu Ile Asn Gly Leu Leu Val Glu Glu Trp Gln His Ala
    130                 135                 140

gca gcc gca gct cac ggt agt ttc cgg cat gat ttt ccc atg aag cgg      480
Ala Ala Ala Ala His Gly Ser Phe Arg His Asp Phe Pro Met Lys Arg
145                 150                 155                 160

ctc cgg tgt tac tcc gac ggt caa tcg tgc tga                          513
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Leu Arg Cys Tyr Ser Asp Gly Gln Ser Cys
165 170

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Ala Phe Asn Thr Arg Thr Ile Lys Asn Glu Glu Glu Thr His Pro Pro
20 25 30

Glu Gln Glu Ala Thr Ile Ala Val Arg Ser Ser Ser Ser Ser Asp Leu
35 40 45

Thr Ala Glu Lys Arg Pro Asp Lys Ile Ile Ala Cys Pro Arg Cys Lys
50 55 60

Ser Met Glu Thr Lys Phe Cys Tyr Phe Asn Asn Tyr Asn Gly Asn Gln
65 70 75 80

Pro Arg His Phe Cys Lys Gly Cys His Arg Tyr Trp Thr Ala Gly Gly
85 90 95

Ala Leu Arg Asn Val Pro Val Gly Ala Gly Arg Arg Lys Ser Lys Pro
100 105 110

Pro Gly Arg Val Val Val Gly Met Leu Gly Asp Gly Asn Gly Val Arg
115 120 125

Gln Val Glu Leu Ile Asn Gly Leu Leu Val Glu Glu Trp Gln His Ala
130 135 140

Ala Ala Ala Ala His Gly Ser Phe Arg His Asp Phe Pro Met Lys Arg
145 150 155 160

Leu Arg Cys Tyr Ser Asp Gly Gln Ser Cys
165 170

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catagagaga agaagacgga acagaggctc caaaaaa atg atg atg gag act aga 115

3932135.seq

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                                                1               5

gat cca gct att aag ctt ttc ggt atg aaa atc cct ttt ccg tcg gtt      163
Asp Pro Ala Ile Lys Leu Phe Gly Met Lys Ile Pro Phe Pro Ser Val
            10                  15                  20

ttt gaa tcg gca gtt acg gtg gag gat gac gaa gaa gat gac tgg agc      211
Phe Glu Ser Ala Val Thr Val Glu Asp Asp Glu Glu Asp Asp Trp Ser
        25                  30                  35

ggc gga gat gac aaa tca cca gag aag gta act cca gag tta tca gat      259
Gly Gly Asp Asp Lys Ser Pro Glu Lys Val Thr Pro Glu Leu Ser Asp
    40                  45                  50

aag aac aac aac aac tgt aac gac aac agt ttt aac aat tcg aaa ccc      307
Lys Asn Asn Asn Asn Cys Asn Asp Asn Ser Phe Asn Asn Ser Lys Pro
55                  60                  65                  70

gaa acc ttg gac aaa gag gaa gcg aca tca act gat cag ata gag agt      355
Glu Thr Leu Asp Lys Glu Glu Ala Thr Ser Thr Asp Gln Ile Glu Ser
                75                  80                  85

agt gac acg cct gag gat aat cag cag acg aca cct gat ggt aaa acc      403
Ser Asp Thr Pro Glu Asp Asn Gln Gln Thr Thr Pro Asp Gly Lys Thr
            90                  95                  100

cta aag aaa ccg act aag att cta ccg tgt ccg aga tgc aaa agc atg      451
Leu Lys Lys Pro Thr Lys Ile Leu Pro Cys Pro Arg Cys Lys Ser Met
        105                 110                 115

gag acc aag ttc tgt tat tac aac aac tac aac ata aac cag cct cgt      499
Glu Thr Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Ile Asn Gln Pro Arg
    120                 125                 130

cat ttc tgc aag gct tgt cag aga tat tgg act gct gga ggg act atg      547
His Phe Cys Lys Ala Cys Gln Arg Tyr Trp Thr Ala Gly Gly Thr Met
135                 140                 145                 150

agg aat gtt cct gtg ggg gca gga cgt cgt aag aac aaa agc tca tct      595
Arg Asn Val Pro Val Gly Ala Gly Arg Arg Lys Asn Lys Ser Ser Ser
                155                 160                 165

tct cat tac cgt cac atc act att tcc gag gct ctt gag gct gcg agg      643
Ser His Tyr Arg His Ile Thr Ile Ser Glu Ala Leu Glu Ala Ala Arg
            170                 175                 180

ctt gac ccg ggc tta cag gca aac aca agg gtc ttg agt ttt ggt ctc      691
Leu Asp Pro Gly Leu Gln Ala Asn Thr Arg Val Leu Ser Phe Gly Leu
        185                 190                 195

gaa gct cag cag cag cac gtt gct gct ccc atg aca cct gtt atg aag      739
Glu Ala Gln Gln Gln His Val Ala Ala Pro Met Thr Pro Val Met Lys
    200                 205                 210

cta caa gaa gat caa aag gtc tca aac ggt gct agg aac agg ttt cac      787
Leu Gln Glu Asp Gln Lys Val Ser Asn Gly Ala Arg Asn Arg Phe His
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215                 220                 225                 230

ggg tta gcg gat caa cgg ctt gta gct cgg gta gag aat gga gat gat      835
Gly Leu Ala Asp Gln Arg Leu Val Ala Arg Val Glu Asn Gly Asp Asp
                235                 240                 245

tgc tca agc gga tcc tct gtg acc acc tct aac aat cac tca gtg gat      883
Cys Ser Ser Gly Ser Ser Val Thr Thr Ser Asn Asn His Ser Val Asp
            250                 255                 260

gaa tca aga gca caa agc ggc agt gtt gtt gaa gca caa atg aac aac      931
Glu Ser Arg Ala Gln Ser Gly Ser Val Val Glu Ala Gln Met Asn Asn
        265                 270                 275

aac aac aac aat aac atg aat ggt tat gct tgc atc cca ggt gtt cca      979
Asn Asn Asn Asn Asn Met Asn Gly Tyr Ala Cys Ile Pro Gly Val Pro
    280                 285                 290

tgg cct tac acg tgg aat cca gcg atg cct cca cca ggt ttt tac ccg     1027
Trp Pro Tyr Thr Trp Asn Pro Ala Met Pro Pro Pro Gly Phe Tyr Pro
295                 300                 305                 310

cct cca ggg tat cca atg ccg ttt tac cct tac tgg acc atc cca atg     1075
Pro Pro Gly Tyr Pro Met Pro Phe Tyr Pro Tyr Trp Thr Ile Pro Met
                315                 320                 325

cta cca ccg cat caa tcc tca tcg cct ata agc caa aag tgt tca aat     1123
Leu Pro Pro His Gln Ser Ser Ser Pro Ile Ser Gln Lys Cys Ser Asn
            330                 335                 340

aca aac tct ccg act ctc gga aag cat ccg aga gat gaa gga tca tcg     1171
Thr Asn Ser Pro Thr Leu Gly Lys His Pro Arg Asp Glu Gly Ser Ser
        345                 350                 355

aaa aag gac aat gag aca gag cga aaa cag aag gcc ggg tgc gtt ctg     1219
Lys Lys Asp Asn Glu Thr Glu Arg Lys Gln Lys Ala Gly Cys Val Leu
    360                 365                 370

gtc ccg aaa acg ttg aga ata gat gat cct aac gaa gca gca aag agc     1267
Val Pro Lys Thr Leu Arg Ile Asp Asp Pro Asn Glu Ala Ala Lys Ser
375                 380                 385                 390

tcg ata tgg aca aca ttg gga atc aag aac gag gcg atg tgc aaa gcc     1315
Ser Ile Trp Thr Thr Leu Gly Ile Lys Asn Glu Ala Met Cys Lys Ala
                395                 400                 405

ggt ggt atg ttc aaa ggg ttt gat cat aag aca aag atg tat aac aac     1363
Gly Gly Met Phe Lys Gly Phe Asp His Lys Thr Lys Met Tyr Asn Asn
            410                 415                 420

gac aaa gct gag aac tcc cct gtt ctt tct gct aac cct gct gct cta     1411
Asp Lys Ala Glu Asn Ser Pro Val Leu Ser Ala Asn Pro Ala Ala Leu
        425                 430                 435

tca aga tca cac aat ttc cat gaa cag att tag agttacatat gtatatgtat   1464
Ser Arg Ser His Asn Phe His Glu Gln Ile
    440                 445
```

atatgtatga ttgattgtat gtatagatga tactggagaa tgatgagttt ttgagaatca 1524

aactcttttc ttctttctag tgattgcctt tattccttta catgttttgg ttctctgtac 1584

actatttgat ttacctttt tactttcttt cttcatttgt caggaaatgt tggaagataa 1644

cattaatggt aaaaagttgg tgtggaccgt tgttgcgttg gcatttcaaa aaaaaaaaaa 1704

aaa 1707

<210> 126 <211> 448 <212> PRT <213> Arabidopsis thaliana <400> 126

Met Met Met Glu Thr Arg Asp Pro Ala Ile Lys Leu Phe Gly Met Lys
1 5 10 15

Ile Pro Phe Pro Ser Val Phe Glu Ser Ala Val Thr Val Glu Asp Asp
20 25 30

Glu Glu Asp Asp Trp Ser Gly Gly Asp Asp Lys Ser Pro Glu Lys Val
35 40 45

Thr Pro Glu Leu Ser Asp Lys Asn Asn Asn Asn Cys Asn Asp Asn Ser
50 55 60

Phe Asn Asn Ser Lys Pro Glu Thr Leu Asp Lys Glu Glu Ala Thr Ser
65 70 75 80

Thr Asp Gln Ile Glu Ser Ser Asp Thr Pro Glu Asp Asn Gln Gln Thr
85 90 95

Thr Pro Asp Gly Lys Thr Leu Lys Lys Pro Thr Lys Ile Leu Pro Cys
100 105 110

Pro Arg Cys Lys Ser Met Glu Thr Lys Phe Cys Tyr Tyr Asn Asn Tyr
115 120 125

Asn Ile Asn Gln Pro Arg His Phe Cys Lys Ala Cys Gln Arg Tyr Trp
130 135 140

Thr Ala Gly Gly Thr Met Arg Asn Val Pro Val Gly Ala Gly Arg Arg
145 150 155 160

Lys Asn Lys Ser Ser Ser Ser His Tyr Arg His Ile Thr Ile Ser Glu
165 170 175

Ala Leu Glu Ala Ala Arg Leu Asp Pro Gly Leu Gln Ala Asn Thr Arg
180 185 190

Val Leu Ser Phe Gly Leu Glu Ala Gln Gln Gln His Val Ala Ala Pro
195 200 205

Met Thr Pro Val Met Lys Leu Gln Glu Asp Gln Lys Val Ser Asn Gly
210 215 220

Ala Arg Asn Arg Phe His Gly Leu Ala Asp Gln Arg Leu Val Ala Arg
225 230 235 240

Val Glu Asn Gly Asp Asp Cys Ser Ser Gly Ser Ser Val Thr Thr Ser
245 250 255

Asn Asn His Ser Val Asp Glu Ser Arg Ala Gln Ser Gly Ser Val Val
260 265 270

Glu Ala Gln Met Asn Asn Asn Asn Asn Asn Asn Met Asn Gly Tyr Ala
275 280 285

Cys Ile Pro Gly Val Pro Trp Pro Tyr Thr Trp Asn Pro Ala Met Pro
290 295 300

Pro Pro Gly Phe Tyr Pro Pro Pro Gly Tyr Pro Met Pro Phe Tyr Pro
305 310 315 320

Tyr Trp Thr Ile Pro Met Leu Pro Pro His Gln Ser Ser Ser Pro Ile
325 330 335

Ser Gln Lys Cys Ser Asn Thr Asn Ser Pro Thr Leu Gly Lys His Pro
340 345 350

Arg Asp Glu Gly Ser Ser Lys Lys Asp Asn Glu Thr Glu Arg Lys Gln
355 360 365

Lys Ala Gly Cys Val Leu Val Pro Lys Thr Leu Arg Ile Asp Asp Pro
370 375 380

Asn Glu Ala Ala Lys Ser Ser Ile Trp Thr Thr Leu Gly Ile Lys Asn
385 390 395 400

```
Glu Ala Met Cys Lys Ala Gly Gly Met Phe Lys Gly Phe Asp His Lys
                405                 410                 415

Thr Lys Met Tyr Asn Asn Asp Lys Ala Glu Asn Ser Pro Val Leu Ser
            420                 425                 430

Ala Asn Pro Ala Ala Leu Ser Arg Ser His Asn Phe His Glu Gln Ile
        435                 440                 445
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<400> 127

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gacatgcatg taagcattcg gttaattaat cgagtcaaag atatatatca gtaaatacat      60

atgtgtatat ttctggaaaa agaatatata tattgagaaa taagaaaag atg aaa atg      118
                                                    Met Lys Met
                                                    1

gaa aat ggt atg tat aaa aag aaa gga gtg tgc gac tct tgt gtc tcg         166
Glu Asn Gly Met Tyr Lys Lys Lys Gly Val Cys Asp Ser Cys Val Ser
    5                   10                  15

tcc aaa agc aga tcc aac cac agc ccc aaa aga agc atg atg gag cct         214
Ser Lys Ser Arg Ser Asn His Ser Pro Lys Arg Ser Met Met Glu Pro
20                  25                  30                  35

cag cct cac cat ctc ctc atg gat tgg aac aaa gct aat gat ctt ctc         262
Gln Pro His His Leu Leu Met Asp Trp Asn Lys Ala Asn Asp Leu Leu
                40                  45                  50

aca caa gaa cac gca gct ttt ctc aat gat cct cac cat ctc atg tta         310
Thr Gln Glu His Ala Ala Phe Leu Asn Asp Pro His His Leu Met Leu
            55                  60                  65

gat cca cct ccc gaa acc cta att cac ttg gac gaa gac gaa gag tac         358
Asp Pro Pro Pro Glu Thr Leu Ile His Leu Asp Glu Asp Glu Glu Tyr
        70                  75                  80

gat gaa gac atg gat gcg atg aag gag atg cag tac atg atc gcc gtc         406
Asp Glu Asp Met Asp Ala Met Lys Glu Met Gln Tyr Met Ile Ala Val
    85                  90                  95

atg cag ccc gta gac atc gac cct gcc acg gtc cct aag ccg aac cgc         454
Met Gln Pro Val Asp Ile Asp Pro Ala Thr Val Pro Lys Pro Asn Arg
100                 105                 110                 115

cgt aac gta agg ata agc gac gat cct cag acg gtg gtt gct cgt cgg         502
Arg Asn Val Arg Ile Ser Asp Asp Pro Gln Thr Val Val Ala Arg Arg
                120                 125                 130

cgt cgg gaa agg atc agc gag aag atc cga att ctc aag agg atc gtg         550
Arg Arg Glu Arg Ile Ser Glu Lys Ile Arg Ile Leu Lys Arg Ile Val
            135                 140                 145
```

cct ggt ggt gcg aag atg gac aca gct tcc atg ctc gac gaa gcc ata 598
Pro Gly Gly Ala Lys Met Asp Thr Ala Ser Met Leu Asp Glu Ala Ile
150 155 160

cgt tac acc aag ttc ttg aaa cgg cag gtg agg att ctt cag cct cac 646
Arg Tyr Thr Lys Phe Leu Lys Arg Gln Val Arg Ile Leu Gln Pro His
165 170 175

tct cag att gga gct cct atg gct aac ccc tct tac ctt tgt tat tac 694
Ser Gln Ile Gly Ala Pro Met Ala Asn Pro Ser Tyr Leu Cys Tyr Tyr
180 185 190 195

cac aac tcc caa ccc tga tgaactacac agaagctcgc tagctagaca 742
His Asn Ser Gln Pro
200

tttggtgtca tcctctcaac cttt 766

<210> 128 <211> 200 <212> PRT <213> Arabidopsis thaliana <400> 128

Met Lys Met Glu Asn Gly Met Tyr Lys Lys Lys Gly Val Cys Asp Ser
1 5 10 15

Cys Val Ser Ser Lys Ser Arg Ser Asn His Ser Pro Lys Arg Ser Met
20 25 30

Met Glu Pro Gln Pro His His Leu Leu Met Asp Trp Asn Lys Ala Asn
35 40 45

Asp Leu Leu Thr Gln Glu His Ala Ala Phe Leu Asn Asp Pro His His
50 55 60

Leu Met Leu Asp Pro Pro Pro Glu Thr Leu Ile His Leu Asp Glu Asp
65 70 75 80

Glu Glu Tyr Asp Glu Asp Met Asp Ala Met Lys Glu Met Gln Tyr Met
85 90 95

Ile Ala Val Met Gln Pro Val Asp Ile Asp Pro Ala Thr Val Pro Lys
100 105 110

Pro Asn Arg Arg Asn Val Arg Ile Ser Asp Asp Pro Gln Thr Val Val
115 120 125

Ala Arg Arg Arg Arg Glu Arg Ile Ser Glu Lys Ile Arg Ile Leu Lys
130 135 140

```
Arg Ile Val Pro Gly Gly Ala Lys Met Asp Thr Ala Ser Met Leu Asp
145                 150                 155                 160

Glu Ala Ile Arg Tyr Thr Lys Phe Leu Lys Arg Gln Val Arg Ile Leu
                165                 170                 175

Gln Pro His Ser Gln Ile Gly Ala Pro Met Ala Asn Pro Ser Tyr Leu
            180                 185                 190

Cys Tyr Tyr His Asn Ser Gln Pro
        195                 200
```

<210> 129 <211> 1913 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (259)..(1593) <223> G789

<400> 129

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ggcaagaaga accttagcct ctctttcttc tttctctctc tctctctctg tggtactgtt     60

ctgtttcaac tttactccct cagtttcaga acaattccct atctagaaga gagataaaac    120

cgagaaggtt ttggagatag aatcttttgt tcttcttttg tccctccttg ctcgattttt    180

gttacgtgtg aagcaataaa aaaaaactga tatagctaaa tcttccatcc attcagaggc    240

ttctaaatct gatctgac atg gaa caa gtg ttt gct gat tgg aat ttt gaa       291
                  Met Glu Gln Val Phe Ala Asp Trp Asn Phe Glu
                  1               5                   10

gat aat ttt cac atg tcc act aat aaa aga tca atc aga cca gaa gat       339
Asp Asn Phe His Met Ser Thr Asn Lys Arg Ser Ile Arg Pro Glu Asp
            15                  20                  25

gaa tta gtg gag cta ttg tgg aga gat ggt caa gtg gtt tta caa agc       387
Glu Leu Val Glu Leu Leu Trp Arg Asp Gly Gln Val Val Leu Gln Ser
        30                  35                  40

caa gct cgt aga gaa ccg tca gtc caa gtc caa acc cac aaa caa gaa       435
Gln Ala Arg Arg Glu Pro Ser Val Gln Val Gln Thr His Lys Gln Glu
    45                  50                  55

acc cta aga aaa ccc aac aat att ttt ctt gac aac caa gaa aca gta       483
Thr Leu Arg Lys Pro Asn Asn Ile Phe Leu Asp Asn Gln Glu Thr Val
60                  65                  70                  75

caa aag cct aac tac gct gct cta gat gat caa gaa acc gtc tcc tgg       531
Gln Lys Pro Asn Tyr Ala Ala Leu Asp Asp Gln Glu Thr Val Ser Trp
                80                  85                  90

ata caa tac cct ccg gat gac gtc atc gac cct ttc gaa tcc gag ttc       579
Ile Gln Tyr Pro Pro Asp Asp Val Ile Asp Pro Phe Glu Ser Glu Phe
            95                  100                 105
```

```
tcc tct cat ttc ttc tct tcg atc gat cac ctc gga ggt cct gag aag      627
Ser Ser His Phe Phe Ser Ser Ile Asp His Leu Gly Gly Pro Glu Lys
        110                 115                 120

cca cga acg atc gaa gag aca gtt aag cat gag gct caa gcc atg gct      675
Pro Arg Thr Ile Glu Glu Thr Val Lys His Glu Ala Gln Ala Met Ala
    125                 130                 135

cct cct aag ttt aga tcc tcg gtt ata aca gtc gga ccg agt cat tgc      723
Pro Pro Lys Phe Arg Ser Ser Val Ile Thr Val Gly Pro Ser His Cys
140                 145                 150                 155

ggc agc aac cag tca aca aat att cat cag gcc act aca ctt ccg gtt      771
Gly Ser Asn Gln Ser Thr Asn Ile His Gln Ala Thr Thr Leu Pro Val
                160                 165                 170

tct atg agt gat aga agc aag aac gtc gaa gaa aga ctt gac act tcg      819
Ser Met Ser Asp Arg Ser Lys Asn Val Glu Glu Arg Leu Asp Thr Ser
            175                 180                 185

tca ggt ggc tcc tcc ggt tgc agc tat gga agg aac aac aaa gaa acc      867
Ser Gly Gly Ser Ser Gly Cys Ser Tyr Gly Arg Asn Asn Lys Glu Thr
        190                 195                 200

gtt agt gga aca agt gta acc att gac cgt aaa aga aaa cat gtt atg      915
Val Ser Gly Thr Ser Val Thr Ile Asp Arg Lys Arg Lys His Val Met
    205                 210                 215

gat gct gat caa gaa tct gtg tct caa tca gat ata ggt ttg acc tca      963
Asp Ala Asp Gln Glu Ser Val Ser Gln Ser Asp Ile Gly Leu Thr Ser
220                 225                 230                 235

acc gat gat caa acc atg ggt aac aaa tcg agc caa cgg tca gga tct     1011
Thr Asp Asp Gln Thr Met Gly Asn Lys Ser Ser Gln Arg Ser Gly Ser
                240                 245                 250

act cga aga agc cgt gca gct gaa gtt cat aat ctc tca gaa agg agg     1059
Thr Arg Arg Ser Arg Ala Ala Glu Val His Asn Leu Ser Glu Arg Arg
            255                 260                 265

agg aga gat cgg atc aat gaa aga atg aaa gct ctt caa gaa ctc ata     1107
Arg Arg Asp Arg Ile Asn Glu Arg Met Lys Ala Leu Gln Glu Leu Ile
        270                 275                 280

cct cac tgc agc aga aca gat aaa gct tcg ata ttg gat gaa gca att     1155
Pro His Cys Ser Arg Thr Asp Lys Ala Ser Ile Leu Asp Glu Ala Ile
    285                 290                 295

gat tac tta aaa tca ctt caa atg caa ctc caa gtg atg tgg atg gga     1203
Asp Tyr Leu Lys Ser Leu Gln Met Gln Leu Gln Val Met Trp Met Gly
300                 305                 310                 315

agt gga atg gcg gcg gcg gca gca gca gca gca agt ccg atg atg ttt     1251
Ser Gly Met Ala Ala Ala Ala Ala Ala Ala Ala Ser Pro Met Met Phe
                320                 325                 330

ccc ggg gta caa tca tct cca tac att aat cag atg gct atg caa agt     1299
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Pro Gly Val Gln Ser Ser Pro Tyr Ile Asn Gln Met Ala Met Gln Ser
            335                 340                 345

cag atg caa ttg tct caa ttc ccg gtt atg aac cgg tcc gct ccg cag     1347
Gln Met Gln Leu Ser Gln Phe Pro Val Met Asn Arg Ser Ala Pro Gln
        350                 355                 360

aac cat ccc ggt tta gta tgt caa aac ccg gta cag ttg cag ctc caa     1395
Asn His Pro Gly Leu Val Cys Gln Asn Pro Val Gln Leu Gln Leu Gln
    365                 370                 375

gca cag aac caa atc tta tcg gag cag ctc gct agg tac atg ggc ggg     1443
Ala Gln Asn Gln Ile Leu Ser Glu Gln Leu Ala Arg Tyr Met Gly Gly
380                 385                 390                 395

att ccc cag atg ccg ccg gcg gga aat cag atg cag acc gtg caa caa     1491
Ile Pro Gln Met Pro Pro Ala Gly Asn Gln Met Gln Thr Val Gln Gln
                400                 405                 410

caa cca gcg gac atg ttg gga ttt gga tct ccg gcg gga ccg caa agt     1539
Gln Pro Ala Asp Met Leu Gly Phe Gly Ser Pro Ala Gly Pro Gln Ser
            415                 420                 425

caa ctg tcg gca ccg gcg acc acc gac agt ctt cat atg ggt aaa ata     1587
Gln Leu Ser Ala Pro Ala Thr Thr Asp Ser Leu His Met Gly Lys Ile
        430                 435                 440

ggc tga cttggcatat agttttcctc cgaaattatt cttcttacag ttggtgattg     1643
Gly

ttatttattt ttggtcgcct aagcaagcat aaaagctaag tcaaatgtat tatagagatc   1703

taataagtta gtctcatact tataacttat ttttaaacag ttgaattata gtatcaatca   1763

agtgttggga acctaaagat catacatgtg tcaatacttt tatatttgtt ctcaaggttc   1823

atcagaaaaa caaaataaaa aggatagact aggcctgcat ttgacattat catgggcttt   1883

tttgggtcta tgaatatgaa cattaacccc                                    1913

<210>  130 <211>  444 <212>  PRT <213>  Arabidopsis thaliana  <400>  130

Met Glu Gln Val Phe Ala Asp Trp Asn Phe Glu Asp Asn Phe His Met
1               5                   10                  15

Ser Thr Asn Lys Arg Ser Ile Arg Pro Glu Asp Glu Leu Val Glu Leu
            20                  25                  30

Leu Trp Arg Asp Gly Gln Val Val Leu Gln Ser Gln Ala Arg Arg Glu
        35                  40                  45

Pro Ser Val Gln Val Gln Thr His Lys Gln Glu Thr Leu Arg Lys Pro
```

50 55 60

Asn Asn Ile Phe Leu Asp Asn Gln Glu Thr Val Gln Lys Pro Asn Tyr
65 70 75 80

Ala Ala Leu Asp Asp Gln Glu Thr Val Ser Trp Ile Gln Tyr Pro Pro
85 90 95

Asp Asp Val Ile Asp Pro Phe Glu Ser Glu Phe Ser Ser His Phe Phe
100 105 110

Ser Ser Ile Asp His Leu Gly Gly Pro Glu Lys Pro Arg Thr Ile Glu
115 120 125

Glu Thr Val Lys His Glu Ala Gln Ala Met Ala Pro Pro Lys Phe Arg
130 135 140

Ser Ser Val Ile Thr Val Gly Pro Ser His Cys Gly Ser Asn Gln Ser
145 150 155 160

Thr Asn Ile His Gln Ala Thr Thr Leu Pro Val Ser Met Ser Asp Arg
165 170 175

Ser Lys Asn Val Glu Glu Arg Leu Asp Thr Ser Ser Gly Gly Ser Ser
180 185 190

Gly Cys Ser Tyr Gly Arg Asn Asn Lys Glu Thr Val Ser Gly Thr Ser
195 200 205

Val Thr Ile Asp Arg Lys Arg Lys His Val Met Asp Ala Asp Gln Glu
210 215 220

Ser Val Ser Gln Ser Asp Ile Gly Leu Thr Ser Thr Asp Asp Gln Thr
225 230 235 240

Met Gly Asn Lys Ser Ser Gln Arg Ser Gly Ser Thr Arg Arg Ser Arg
245 250 255

Ala Ala Glu Val His Asn Leu Ser Glu Arg Arg Arg Arg Asp Arg Ile
260 265 270

Asn Glu Arg Met Lys Ala Leu Gln Glu Leu Ile Pro His Cys Ser Arg
275 280 285

Thr Asp Lys Ala Ser Ile Leu Asp Glu Ala Ile Asp Tyr Leu Lys Ser
290 295 300

Leu Gln Met Gln Leu Gln Val Met Trp Met Gly Ser Gly Met Ala Ala
305 310 315 320

Ala Ala Ala Ala Ala Ala Ser Pro Met Met Phe Pro Gly Val Gln Ser
325 330 335

Ser Pro Tyr Ile Asn Gln Met Ala Met Gln Ser Gln Met Gln Leu Ser
340 345 350

Gln Phe Pro Val Met Asn Arg Ser Ala Pro Gln Asn His Pro Gly Leu
355 360 365

Val Cys Gln Asn Pro Val Gln Leu Gln Leu Gln Ala Gln Asn Gln Ile
370 375 380

Leu Ser Glu Gln Leu Ala Arg Tyr Met Gly Gly Ile Pro Gln Met Pro
385 390 395 400

Pro Ala Gly Asn Gln Met Gln Thr Val Gln Gln Gln Pro Ala Asp Met
405 410 415

Leu Gly Phe Gly Ser Pro Ala Gly Pro Gln Ser Gln Leu Ser Ala Pro
420 425 430

Ala Thr Thr Asp Ser Leu His Met Gly Lys Ile Gly
435 440

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<222> (173)..(877) <223> G791

<400> 131
ttttctttgg gtgttccttc caccaacggc agaaatcgat tcggcttaaa tctccccctc 60

ctttcgatct ctctgatcgc cgccgggaac attcaatttc ccgggagttc aacaaaaaaa 120

aaactctccg tttttatttt tccccctttt tcaccggtgg aagtttccgg ag atg gtg 178
Met Val
1

tca ccc gaa aac gct aat tgg att tgt gac ttg atc gat gct gat tac 226
Ser Pro Glu Asn Ala Asn Trp Ile Cys Asp Leu Ile Asp Ala Asp Tyr
5 10 15

```
gga agt ttc aca atc caa ggt cct ggt ttc tct tgg cct gtt cag caa      274
Gly Ser Phe Thr Ile Gln Gly Pro Gly Phe Ser Trp Pro Val Gln Gln
    20                  25                  30

cct att ggt gtt tct tct aac tcc agt gct gga gtt gat ggc tcg gct      322
Pro Ile Gly Val Ser Ser Asn Ser Ser Ala Gly Val Asp Gly Ser Ala
35                  40                  45                  50

gga aac tca gaa gct agc aaa gaa cct gga tcc aaa aag agg ggg aga      370
Gly Asn Ser Glu Ala Ser Lys Glu Pro Gly Ser Lys Lys Arg Gly Arg
                55                  60                  65

tgt gaa tca tcc tct gcc act agc tcg aaa gca tgt aga gag aag cag      418
Cys Glu Ser Ser Ser Ala Thr Ser Ser Lys Ala Cys Arg Glu Lys Gln
            70                  75                  80

cga cgg gac agg ttg aat gac aag ttt atg gaa ttg ggt gca att ttg      466
Arg Arg Asp Arg Leu Asn Asp Lys Phe Met Glu Leu Gly Ala Ile Leu
        85                  90                  95

gag cct gga aat cct ccc aaa aca gac aag gct gct atc ttg gtt gat      514
Glu Pro Gly Asn Pro Pro Lys Thr Asp Lys Ala Ala Ile Leu Val Asp
    100                 105                 110

gct gtc cgc atg gtg aca cag cta cgg ggc gag gcc cag aag ctg aag      562
Ala Val Arg Met Val Thr Gln Leu Arg Gly Glu Ala Gln Lys Leu Lys
115                 120                 125                 130

gac tcc aat tca agt ctt cag gac aaa atc aaa gag tta aag act gag      610
Asp Ser Asn Ser Ser Leu Gln Asp Lys Ile Lys Glu Leu Lys Thr Glu
                135                 140                 145

aaa aac gag ctg cga gat gag aaa cag agg ctg aag aca gag aaa gaa      658
Lys Asn Glu Leu Arg Asp Glu Lys Gln Arg Leu Lys Thr Glu Lys Glu
            150                 155                 160

aag ctg gag cag cag ctg aaa gcc atg aat gct cct caa cca agt ttt      706
Lys Leu Glu Gln Gln Leu Lys Ala Met Asn Ala Pro Gln Pro Ser Phe
        165                 170                 175

ttc cca gcc cca cct atg atg cct act gct ttt gct tca gcg caa ggc      754
Phe Pro Ala Pro Pro Met Met Pro Thr Ala Phe Ala Ser Ala Gln Gly
    180                 185                 190

caa gct cct gga aac aag atg gtg cca atc atc agt tac cca gga gtt      802
Gln Ala Pro Gly Asn Lys Met Val Pro Ile Ile Ser Tyr Pro Gly Val
195                 200                 205                 210

gcc atg tgg cag ttc atg cct cct gct tca gtc gat act tct cag gat      850
Ala Met Trp Gln Phe Met Pro Pro Ala Ser Val Asp Thr Ser Gln Asp
                215                 220                 225

cat gtc ctt cgt cct cct gtt gct taa tcaagaaaaa tcatcaaccg            897
His Val Leu Arg Pro Pro Val Ala
            230
```

gtttgcttct tgcttccgct taaaagaaaa gtctccattt gttttgctct cctctctttc 957

tcggctttct tagtcttatc cttttgcttt gtcgtgttat catcgtaact gttatctgtt 1017

gaacaatgat atgacattgt aaactccaat tgcttcgcgc aatgttatct attcacatgt 1077

aaatttaagt agagtttggc aaaaaaaaaa 1107

<210> 132 <211> 234 <212> PRT <213> Arabidopsis thaliana <400> 132

Met Val Ser Pro Glu Asn Ala Asn Trp Ile Cys Asp Leu Ile Asp Ala
1 5 10 15

Asp Tyr Gly Ser Phe Thr Ile Gln Gly Pro Gly Phe Ser Trp Pro Val
20 25 30

Gln Gln Pro Ile Gly Val Ser Ser Asn Ser Ser Ala Gly Val Asp Gly
35 40 45

Ser Ala Gly Asn Ser Glu Ala Ser Lys Glu Pro Gly Ser Lys Lys Arg
50 55 60

Gly Arg Cys Glu Ser Ser Ser Ala Thr Ser Ser Lys Ala Cys Arg Glu
65 70 75 80

Lys Gln Arg Arg Asp Arg Leu Asn Asp Lys Phe Met Glu Leu Gly Ala
85 90 95

Ile Leu Glu Pro Gly Asn Pro Pro Lys Thr Asp Lys Ala Ala Ile Leu
100 105 110

Val Asp Ala Val Arg Met Val Thr Gln Leu Arg Gly Glu Ala Gln Lys
115 120 125

Leu Lys Asp Ser Asn Ser Ser Leu Gln Asp Lys Ile Lys Glu Leu Lys
130 135 140

Thr Glu Lys Asn Glu Leu Arg Asp Glu Lys Gln Arg Leu Lys Thr Glu
145 150 155 160

Lys Glu Lys Leu Glu Gln Gln Leu Lys Ala Met Asn Ala Pro Gln Pro
165 170 175

Ser Phe Phe Pro Ala Pro Pro Met Met Pro Thr Ala Phe Ala Ser Ala
180 185 190

```
Gln Gly Gln Ala Pro Gly Asn Lys Met Val Pro Ile Ile Ser Tyr Pro
        195                 200                 205

Gly Val Ala Met Trp Gln Phe Met Pro Pro Ala Ser Val Asp Thr Ser
    210                 215                 220

Gln Asp His Val Leu Arg Pro Pro Val Ala
225                 230
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<210> 133 <211> 1009 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (27)..(746) <223> G801

<400> 133

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gatagtgata acgaaatcct aattcc atg gcc gac aac gac gga gca gtg agt      53
                              Met Ala Asp Asn Asp Gly Ala Val Ser
                              1               5

aac ggc atc ata gtc gag cag acg tca aac aaa gga cct ctt aac gcc      101
Asn Gly Ile Ile Val Glu Gln Thr Ser Asn Lys Gly Pro Leu Asn Ala
10                  15                  20                  25

gtt aag aaa cca ccg tct aaa gat cga cac agc aaa gtt gac gga aga      149
Val Lys Lys Pro Pro Ser Lys Asp Arg His Ser Lys Val Asp Gly Arg
                30                  35                  40

gga aga agg att cgt atg cca atc att tgc gca gct cga gtt ttt caa      197
Gly Arg Arg Ile Arg Met Pro Ile Ile Cys Ala Ala Arg Val Phe Gln
            45                  50                  55

ttg acc aga gag tta ggt cac aag tcc gat ggt caa acc ata gag tgg      245
Leu Thr Arg Glu Leu Gly His Lys Ser Asp Gly Gln Thr Ile Glu Trp
        60                  65                  70

ctt ctc cgt caa gct gag cct tct atc ata gcc gcc act gga act ggc      293
Leu Leu Arg Gln Ala Glu Pro Ser Ile Ile Ala Ala Thr Gly Thr Gly
    75                  80                  85

act act ccg gcg agt ttc tcc act gct tct ctc tcc act tct tct ccg      341
Thr Thr Pro Ala Ser Phe Ser Thr Ala Ser Leu Ser Thr Ser Ser Pro
90                  95                  100                 105

ttt act ctc ggg aaa cgt gtc gtc aga gcg gag gaa gga gaa tcc ggc      389
Phe Thr Leu Gly Lys Arg Val Val Arg Ala Glu Glu Gly Glu Ser Gly
                110                 115                 120

ggc gga gga gga gga ggg tta aca gtg gga cac aca atg ggg act tcg      437
Gly Gly Gly Gly Gly Gly Leu Thr Val Gly His Thr Met Gly Thr Ser
            125                 130                 135

tta atg ggt ggt ggt ggt tct ggt ggg ttt tgg gct gtt ccg gcg agg      485
Leu Met Gly Gly Gly Gly Ser Gly Gly Phe Trp Ala Val Pro Ala Arg
        140                 145                 150
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ccg gat ttc gga caa gtc tgg agc ttt gca acc gga gct cca ccg gaa 533
Pro Asp Phe Gly Gln Val Trp Ser Phe Ala Thr Gly Ala Pro Pro Glu
155 160 165

atg gtt ttt gcg cag cag cag caa cca gct aca ctc ttc gtc cgc cac 581
Met Val Phe Ala Gln Gln Gln Gln Pro Ala Thr Leu Phe Val Arg His
170 175 180 185

cag cag caa cag caa gct tcc gcc gcc gca gca gct gca atg ggt gag 629
Gln Gln Gln Gln Gln Ala Ser Ala Ala Ala Ala Ala Ala Met Gly Glu
190 195 200

gct tca gca gct aga gtt ggg aat tat ctt ccg ggt cat cat ctc aat 677
Ala Ser Ala Ala Arg Val Gly Asn Tyr Leu Pro Gly His His Leu Asn
205 210 215

ttg ctt gct tct ttg tct ggt gga gct aac ggg tcg ggt cgg agg gaa 725
Leu Leu Ala Ser Leu Ser Gly Gly Ala Asn Gly Ser Gly Arg Arg Glu
220 225 230

gac gac cac gaa cca cgt tga gaaatggtat tgtctttttg gtaatgtata 776
Asp Asp His Glu Pro Arg
235

gaaaaattcc tatgttttat gtcatcgaaa gtgtttagaa agtacctcta atttgcggtt 836

tcttttgctc ctttttttact taatttaagc ttattgcttg tttgattagg gttttagggt 896

ttaagaatat ttggtctcgt taatttgttt cggagagtga tagaaagaga gagagattga 956

ttgattgttg tacctaaaac gctataaaag ctctgttttt actagcgaaa aaa 1009

<210> 134 <211> 239 <212> PRT <213> Arabidopsis thaliana <400> 134

Met Ala Asp Asn Asp Gly Ala Val Ser Asn Gly Ile Ile Val Glu Gln
1 5 10 15

Thr Ser Asn Lys Gly Pro Leu Asn Ala Val Lys Lys Pro Pro Ser Lys
20 25 30

Asp Arg His Ser Lys Val Asp Gly Arg Gly Arg Arg Ile Arg Met Pro
35 40 45

Ile Ile Cys Ala Ala Arg Val Phe Gln Leu Thr Arg Glu Leu Gly His
50 55 60

Lys Ser Asp Gly Gln Thr Ile Glu Trp Leu Leu Arg Gln Ala Glu Pro
65 70 75 80

Ser Ile Ile Ala Ala Thr Gly Thr Gly Thr Thr Pro Ala Ser Phe Ser

85 90 95

Thr Ala Ser Leu Ser Thr Ser Ser Pro Phe Thr Leu Gly Lys Arg Val
100 105 110

Val Arg Ala Glu Glu Gly Glu Ser Gly Gly Gly Gly Gly Gly Gly Leu
115 120 125

Thr Val Gly His Thr Met Gly Thr Ser Leu Met Gly Gly Gly Gly Ser
130 135 140

Gly Gly Phe Trp Ala Val Pro Ala Arg Pro Asp Phe Gly Gln Val Trp
145 150 155 160

Ser Phe Ala Thr Gly Ala Pro Pro Glu Met Val Phe Ala Gln Gln Gln
165 170 175

Gln Pro Ala Thr Leu Phe Val Arg His Gln Gln Gln Gln Gln Ala Ser
180 185 190

Ala Ala Ala Ala Ala Ala Met Gly Glu Ala Ser Ala Ala Arg Val Gly
195 200 205

Asn Tyr Leu Pro Gly His His Leu Asn Leu Leu Ala Ser Leu Ser Gly
210 215 220

Gly Ala Asn Gly Ser Gly Arg Arg Glu Asp Asp His Glu Pro Arg
225 230 235

<210> 135 <211> 1263 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (114)..(1139) <223> G804

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atactccaag aatttatagg ttataagtaa aaattcagta caagtttgtt tgtttgttta 60

ttccattttc ttgtgtgttt ttttccccat aatttataaa ttttataagc aat atg 116
Met
1

gag tcc cac aac aac aac cag agc aac aac aac acc act ggt tcg gcc 164
Glu Ser His Asn Asn Asn Gln Ser Asn Asn Asn Thr Thr Gly Ser Ala
5 10 15

cat ctg gtc cca tcc atg gga cca atc tcc ggt tca gtc tca tta acc 212
His Leu Val Pro Ser Met Gly Pro Ile Ser Gly Ser Val Ser Leu Thr
20 25 30

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acc act gct cca aac tcc act acc acc acc gtc acc gcc gct aaa aca      260
Thr Thr Ala Pro Asn Ser Thr Thr Thr Thr Val Thr Ala Ala Lys Thr
    35                  40                  45

ccc gca aaa cga ccg tcc aag gac cgt cac atc aaa gta gac gga cgt      308
Pro Ala Lys Arg Pro Ser Lys Asp Arg His Ile Lys Val Asp Gly Arg
50                  55                  60                  65

ggc cgg agg ata cgt atg ccg gct atc tgc gca gca cgt gtc ttc caa      356
Gly Arg Arg Ile Arg Met Pro Ala Ile Cys Ala Ala Arg Val Phe Gln
                70                  75                  80

cta aca cgt gag tta caa cac aaa tcg gac ggc gag act ata gag tgg      404
Leu Thr Arg Glu Leu Gln His Lys Ser Asp Gly Glu Thr Ile Glu Trp
            85                  90                  95

ctg ctc caa caa gcg gag cca gct atc atc gca gcc acc gga act gga      452
Leu Leu Gln Gln Ala Glu Pro Ala Ile Ile Ala Ala Thr Gly Thr Gly
        100                 105                 110

acc ata ccg gcg aat atc tct act ttg aac atc tct ctt cga agc agt      500
Thr Ile Pro Ala Asn Ile Ser Thr Leu Asn Ile Ser Leu Arg Ser Ser
    115                 120                 125

ggc tct act ctt tca gct cca ctg tct aaa tct ttc cac atg gga aga      548
Gly Ser Thr Leu Ser Ala Pro Leu Ser Lys Ser Phe His Met Gly Arg
130                 135                 140                 145

gcg gct caa aac gct gcc gtt ttt ggg ttc cag caa cag ctt tat cat      596
Ala Ala Gln Asn Ala Ala Val Phe Gly Phe Gln Gln Gln Leu Tyr His
                150                 155                 160

cct cat cat atc acg aca gat tct tct tct tct tct ctt ccc aaa aca      644
Pro His His Ile Thr Thr Asp Ser Ser Ser Ser Ser Leu Pro Lys Thr
            165                 170                 175

ttc cgt gaa gaa gat ctt ttt aaa gat cct aat ttt cta gat caa gaa      692
Phe Arg Glu Glu Asp Leu Phe Lys Asp Pro Asn Phe Leu Asp Gln Glu
        180                 185                 190

ccc ggt tca aga tca cct aaa ccg gga tcc gaa gct cct gat caa gat      740
Pro Gly Ser Arg Ser Pro Lys Pro Gly Ser Glu Ala Pro Asp Gln Asp
    195                 200                 205

ccg ggt tcg acc cgg tca aga aca caa aat atg ata ccg ccg atg tgg      788
Pro Gly Ser Thr Arg Ser Arg Thr Gln Asn Met Ile Pro Pro Met Trp
210                 215                 220                 225

gca cta gcg cca acg cca gcc tcc aca aac gga ggt agt gct ttt tgg      836
Ala Leu Ala Pro Thr Pro Ala Ser Thr Asn Gly Gly Ser Ala Phe Trp
                230                 235                 240

atg tta cca gtc gga gga gga gga ggt ccg gct aac gtt cag gat cca      884
Met Leu Pro Val Gly Gly Gly Gly Gly Pro Ala Asn Val Gln Asp Pro
            245                 250                 255

tca cag cac atg tgg gcg ttt aat ccg ggt cat tac ccg ggt cga atc      932
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Ser Gln His Met Trp Ala Phe Asn Pro Gly His Tyr Pro Gly Arg Ile
        260                 265                 270

ggg tcg gtt cag cta ggg tct atg tta gtg gga ggt caa cag tta ggg      980
Gly Ser Val Gln Leu Gly Ser Met Leu Val Gly Gly Gln Gln Leu Gly
    275                 280                 285

tta ggt gtt gca gaa aat aac aat ttg ggg cta ttt tcc ggc gga gga     1028
Leu Gly Val Ala Glu Asn Asn Asn Leu Gly Leu Phe Ser Gly Gly Gly
290                 295                 300                 305

gga gac ggt ggt cgg gtt ggt ctc gga atg agt ctt gag caa aag cct     1076
Gly Asp Gly Gly Arg Val Gly Leu Gly Met Ser Leu Glu Gln Lys Pro
                310                 315                 320

caa cat caa gtg agt gat cat gct act aga gac caa aat cct act ata     1124
Gln His Gln Val Ser Asp His Ala Thr Arg Asp Gln Asn Pro Thr Ile
            325                 330                 335

gat ggt tct cct tga aagacttcat gatttctttg gtttttaaaa agtgtgaatg     1179
Asp Gly Ser Pro
        340

tgtgatttat tgcaactttt gttgaggact ccaatgttaa tatgggtttt agggttggct   1239

tttcgggatt gccaaattgt tatt                                         1263

<210>  136 <211>  341 <212>  PRT <213>  Arabidopsis thaliana  <400>  136

Met Glu Ser His Asn Asn Asn Gln Ser Asn Asn Asn Thr Thr Gly Ser
1               5                   10                  15

Ala His Leu Val Pro Ser Met Gly Pro Ile Ser Gly Ser Val Ser Leu
            20                  25                  30

Thr Thr Thr Ala Pro Asn Ser Thr Thr Thr Thr Val Thr Ala Ala Lys
        35                  40                  45

Thr Pro Ala Lys Arg Pro Ser Lys Asp Arg His Ile Lys Val Asp Gly
    50                  55                  60

Arg Gly Arg Arg Ile Arg Met Pro Ala Ile Cys Ala Ala Arg Val Phe
65                  70                  75                  80

Gln Leu Thr Arg Glu Leu Gln His Lys Ser Asp Gly Glu Thr Ile Glu
                85                  90                  95

Trp Leu Leu Gln Gln Ala Glu Pro Ala Ile Ile Ala Ala Thr Gly Thr
            100                 105                 110
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Gly Thr Ile Pro Ala Asn Ile Ser Thr Leu Asn Ile Ser Leu Arg Ser
115 120 125

Ser Gly Ser Thr Leu Ser Ala Pro Leu Ser Lys Ser Phe His Met Gly
130 135 140

Arg Ala Ala Gln Asn Ala Ala Val Phe Gly Phe Gln Gln Gln Leu Tyr
145 150 155 160

His Pro His His Ile Thr Thr Asp Ser Ser Ser Ser Ser Leu Pro Lys
165 170 175

Thr Phe Arg Glu Glu Asp Leu Phe Lys Asp Pro Asn Phe Leu Asp Gln
180 185 190

Glu Pro Gly Ser Arg Ser Pro Lys Pro Gly Ser Glu Ala Pro Asp Gln
195 200 205

Asp Pro Gly Ser Thr Arg Ser Arg Thr Gln Asn Met Ile Pro Pro Met
210 215 220

Trp Ala Leu Ala Pro Thr Pro Ala Ser Thr Asn Gly Gly Ser Ala Phe
225 230 235 240

Trp Met Leu Pro Val Gly Gly Gly Gly Gly Pro Ala Asn Val Gln Asp
245 250 255

Pro Ser Gln His Met Trp Ala Phe Asn Pro Gly His Tyr Pro Gly Arg
260 265 270

Ile Gly Ser Val Gln Leu Gly Ser Met Leu Val Gly Gly Gln Gln Leu
275 280 285

Gly Leu Gly Val Ala Glu Asn Asn Asn Leu Gly Leu Phe Ser Gly Gly
290 295 300

Gly Gly Asp Gly Gly Arg Val Gly Leu Gly Met Ser Leu Glu Gln Lys
305 310 315 320

Pro Gln His Gln Val Ser Asp His Ala Thr Arg Asp Gln Asn Pro Thr
325 330 335

Ile Asp Gly Ser Pro
340

<210> 137 <211> 1231 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (107)..(1084) <223> G805

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ccacttcccc cccaccaaag cttcgatcat catcatcatc atcatc atg gat ccg 115
Met Asp Pro
1

gat ccg gat cat aac cat cga ccc aac ttc cct ctc cag ctt ctt gat 163
Asp Pro Asp His Asn His Arg Pro Asn Phe Pro Leu Gln Leu Leu Asp
5 10 15

tct tct acc tcc tcc tct tcc act tcc tta gcc atc atc tct act act 211
Ser Ser Thr Ser Ser Ser Ser Thr Ser Leu Ala Ile Ile Ser Thr Thr
20 25 30 35

tcc gaa cct aac tcc gaa cct aag aag cct cct cct aaa cga acc tct 259
Ser Glu Pro Asn Ser Glu Pro Lys Lys Pro Pro Pro Lys Arg Thr Ser
40 45 50

act aaa gac cga cac acc aaa gtc gaa ggc cga ggc cgt cgg atc cgt 307
Thr Lys Asp Arg His Thr Lys Val Glu Gly Arg Gly Arg Arg Ile Arg
55 60 65

atg cct gcc atg tgt gct gca cgt gtc ttt cag ctc aca cgt gag ctt 355
Met Pro Ala Met Cys Ala Ala Arg Val Phe Gln Leu Thr Arg Glu Leu
70 75 80

ggt cac aaa tcc gac ggt gaa act att gag tgg cta ctc caa caa gca 403
Gly His Lys Ser Asp Gly Glu Thr Ile Glu Trp Leu Leu Gln Gln Ala
85 90 95

gaa cca gcg gtt ata gcc gct aca ggg act gga acc att ccg gct aac 451
Glu Pro Ala Val Ile Ala Ala Thr Gly Thr Gly Thr Ile Pro Ala Asn
100 105 110 115

ttc act tct tta aac atc tca ctt cgt agc tca aga tct tct ctc tct 499
Phe Thr Ser Leu Asn Ile Ser Leu Arg Ser Ser Arg Ser Ser Leu Ser
120 125 130

gct gct cat ctt cgt aca act cct agt agc tat tac ttt cat tca cca 547
Ala Ala His Leu Arg Thr Thr Pro Ser Ser Tyr Tyr Phe His Ser Pro
135 140 145

cat cag tcc atg act cat cat ctt caa cat cag cat cag gtt cgt ccc 595
His Gln Ser Met Thr His His Leu Gln His Gln His Gln Val Arg Pro
150 155 160

aag aac gag tca cat tct tcg tct tct tct tct tca cag ctt tta gat 643
Lys Asn Glu Ser His Ser Ser Ser Ser Ser Ser Ser Gln Leu Leu Asp
165 170 175

cac aac caa atg ggt aac tat cta gta caa tca act gct gga tct tta 691
His Asn Gln Met Gly Asn Tyr Leu Val Gln Ser Thr Ala Gly Ser Leu
180 185 190 195

cct acg agt cag agt cct gca acg gca ccg ttt tgg agt agt ggt gac 739
Pro Thr Ser Gln Ser Pro Ala Thr Ala Pro Phe Trp Ser Ser Gly Asp
200 205 210

aac aca cag aat ctt tgg gct ttt aat att aat cct cat cat tcc ggt 787
Asn Thr Gln Asn Leu Trp Ala Phe Asn Ile Asn Pro His His Ser Gly
215 220 225

gtt gtc gcc gga gat gtt tac aac ccc aac agt ggt ggt agt ggc ggc 835
Val Val Ala Gly Asp Val Tyr Asn Pro Asn Ser Gly Gly Ser Gly Gly
230 235 240

ggt agt gga gtt cat ttg atg aat ttt gca gct cct att gct ttg ttt 883
Gly Ser Gly Val His Leu Met Asn Phe Ala Ala Pro Ile Ala Leu Phe
245 250 255

tct gga cag cct ttg gct tct ggt tat gga gga gga gga ggt ggc ggt 931
Ser Gly Gln Pro Leu Ala Ser Gly Tyr Gly Gly Gly Gly Gly Gly Gly
260 265 270 275

gga gaa cat agc cat tat gga gtt tta gcg gcg ttg aat gct gct tac 979
Gly Glu His Ser His Tyr Gly Val Leu Ala Ala Leu Asn Ala Ala Tyr
280 285 290

cga ccg gtg gcg gag acg ggg aac cat aac aac aac cag caa aac cgt 1027
Arg Pro Val Ala Glu Thr Gly Asn His Asn Asn Asn Gln Gln Asn Arg
295 300 305

gac gga gat cat cat cac aac cat caa gaa gat gga agc acc agt cat 1075
Asp Gly Asp His His His Asn His Gln Glu Asp Gly Ser Thr Ser His
310 315 320

cat tcc tag gcaaacatac acaaacaaat atattctgtg agatttattt 1124
His Ser
325

ttctttttt gtcctttcgt ttgtttgttt gttcttaaca agcgtgtttt ttttgcattg 1184

cttctttttc atatattttt atttatttct aaattctaat aaaaaaa 1231

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Met Asp Pro Asp Pro Asp His Asn His Arg Pro Asn Phe Pro Leu Gln
1 5 10 15

Leu Leu Asp Ser Ser Thr Ser Ser Ser Ser Thr Ser Leu Ala Ile Ile
20 25 30

Ser Thr Thr Ser Glu Pro Asn Ser Glu Pro Lys Lys Pro Pro Pro Lys

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         35                  40                  45

Arg Thr Ser Thr Lys Asp Arg His Thr Lys Val Glu Gly Arg Gly Arg
    50                  55                  60

Arg Ile Arg Met Pro Ala Met Cys Ala Ala Arg Val Phe Gln Leu Thr
65                  70                  75                  80

Arg Glu Leu Gly His Lys Ser Asp Gly Glu Thr Ile Glu Trp Leu Leu
                85                  90                  95

Gln Gln Ala Glu Pro Ala Val Ile Ala Ala Thr Gly Thr Gly Thr Ile
            100                 105                 110

Pro Ala Asn Phe Thr Ser Leu Asn Ile Ser Leu Arg Ser Ser Arg Ser
        115                 120                 125

Ser Leu Ser Ala Ala His Leu Arg Thr Thr Pro Ser Ser Tyr Tyr Phe
    130                 135                 140

His Ser Pro His Gln Ser Met Thr His His Leu Gln His Gln His Gln
145                 150                 155                 160

Val Arg Pro Lys Asn Glu Ser His Ser Ser Ser Ser Ser Ser Ser Gln
                165                 170                 175

Leu Leu Asp His Asn Gln Met Gly Asn Tyr Leu Val Gln Ser Thr Ala
            180                 185                 190

Gly Ser Leu Pro Thr Ser Gln Ser Pro Ala Thr Ala Pro Phe Trp Ser
        195                 200                 205

Ser Gly Asp Asn Thr Gln Asn Leu Trp Ala Phe Asn Ile Asn Pro His
    210                 215                 220

His Ser Gly Val Val Ala Gly Asp Val Tyr Asn Pro Asn Ser Gly Gly
225                 230                 235                 240

Ser Gly Gly Gly Ser Gly Val His Leu Met Asn Phe Ala Ala Pro Ile
                245                 250                 255

Ala Leu Phe Ser Gly Gln Pro Leu Ala Ser Gly Tyr Gly Gly Gly Gly
            260                 265                 270
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Gly Gly Gly Gly Glu His Ser His Tyr Gly Val Leu Ala Ala Leu Asn
        275                 280                 285

Ala Ala Tyr Arg Pro Val Ala Glu Thr Gly Asn His Asn Asn Asn Gln
    290                 295                 300

Gln Asn Arg Asp Gly Asp His His His Asn His Gln Glu Asp Gly Ser
305                 310                 315                 320

Thr Ser His His Ser
                325
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<210> 139 <211> 952 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (65)..(883) <223> G812

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cagg atg atg aac ccg ttt ctc ccg gaa ggc tgc gat cca cca cca cca      109
     Met Met Asn Pro Phe Leu Pro Glu Gly Cys Asp Pro Pro Pro Pro
     1               5                  10                  15

cca caa cca atg gag ggt tta cac gaa aat gct cca cct cca ttt ctg      157
Pro Gln Pro Met Glu Gly Leu His Glu Asn Ala Pro Pro Pro Phe Leu
                20                  25                  30

acc aag aca ttt gag atg gtg gat gat cca aac act gac cac atc gta      205
Thr Lys Thr Phe Glu Met Val Asp Asp Pro Asn Thr Asp His Ile Val
            35                  40                  45

tct tgg aac aga gga gga aca agt ttt gtc gtc tgg gat ttg cat tct      253
Ser Trp Asn Arg Gly Gly Thr Ser Phe Val Val Trp Asp Leu His Ser
        50                  55                  60

ttc tcc acg att ctc ctt cct cgt cat ttc aaa cac agc aat ttc tca      301
Phe Ser Thr Ile Leu Leu Pro Arg His Phe Lys His Ser Asn Phe Ser
    65                  70                  75

agt ttc atc aga caa ctc aat act tat ggt ttc aga aag ata gaa gca      349
Ser Phe Ile Arg Gln Leu Asn Thr Tyr Gly Phe Arg Lys Ile Glu Ala
80                  85                  90                  95

gag aga tgg gaa ttt gca aac gaa gag ttt ttg tta gga caa aga cag      397
Glu Arg Trp Glu Phe Ala Asn Glu Glu Phe Leu Leu Gly Gln Arg Gln
                100                 105                 110

ttg ttg aag aac atc aag agg aga aac cct ttt act cca tca tct tca      445
Leu Leu Lys Asn Ile Lys Arg Arg Asn Pro Phe Thr Pro Ser Ser Ser
            115                 120                 125

cca agc cat gac gct tgc aac gag ctt cgc aga gag aag caa gtg cta      493
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Pro Ser His Asp Ala Cys Asn Glu Leu Arg Arg Glu Lys Gln Val Leu
        130                 135                 140

atg atg gag ata gtg agt cta aga cag cag caa caa aca acg aaa agc      541
Met Met Glu Ile Val Ser Leu Arg Gln Gln Gln Gln Thr Thr Lys Ser
    145                 150                 155

tac atc aaa gct atg gaa cag agg ata gaa gga aca gag agg aaa cag      589
Tyr Ile Lys Ala Met Glu Gln Arg Ile Glu Gly Thr Glu Arg Lys Gln
160                 165                 170                 175

aga caa atg atg tcg ttt ctg gct aga gca atg cag agt cct tcg ttt      637
Arg Gln Met Met Ser Phe Leu Ala Arg Ala Met Gln Ser Pro Ser Phe
                180                 185                 190

ttg cat cag ttg ttg aaa caa aga gat aaa aaa att aag gag ctt gag      685
Leu His Gln Leu Leu Lys Gln Arg Asp Lys Lys Ile Lys Glu Leu Glu
            195                 200                 205

gat aat gag tca gca aag agg aaa aga ggt tct tct tcg atg tcg gaa      733
Asp Asn Glu Ser Ala Lys Arg Lys Arg Gly Ser Ser Ser Met Ser Glu
        210                 215                 220

ttg gaa gtt ttg gct ttg gag atg caa ggg cat gga aaa cag agg aat      781
Leu Glu Val Leu Ala Leu Glu Met Gln Gly His Gly Lys Gln Arg Asn
    225                 230                 235

atg ttg gaa gaa gag gat cat caa ctg gtg gta gag aga gag ttg gat      829
Met Leu Glu Glu Glu Asp His Gln Leu Val Val Glu Arg Glu Leu Asp
240                 245                 250                 255

gat ggt ttc tgg gaa gag ttg ctt agt gat gag agt ttg gct tcc acc      877
Asp Gly Phe Trp Glu Glu Leu Leu Ser Asp Glu Ser Leu Ala Ser Thr
                260                 265                 270

tcc taa ctagatggat ttctttttgg ttttgttttt agtttcttct actttcaagc      933
Ser

tcattttctt ctgtcacaa                                               952

<210>  140 <211>  272 <212>  PRT <213>  Arabidopsis thaliana  <400>  140

Met Met Asn Pro Phe Leu Pro Glu Gly Cys Asp Pro Pro Pro Pro Pro
1               5                   10                  15

Gln Pro Met Glu Gly Leu His Glu Asn Ala Pro Pro Pro Phe Leu Thr
            20                  25                  30

Lys Thr Phe Glu Met Val Asp Asp Pro Asn Thr Asp His Ile Val Ser
        35                  40                  45

Trp Asn Arg Gly Gly Thr Ser Phe Val Val Trp Asp Leu His Ser Phe
```

50 55 60

Ser Thr Ile Leu Leu Pro Arg His Phe Lys His Ser Asn Phe Ser Ser
65 70 75 80

Phe Ile Arg Gln Leu Asn Thr Tyr Gly Phe Arg Lys Ile Glu Ala Glu
85 90 95

Arg Trp Glu Phe Ala Asn Glu Glu Phe Leu Leu Gly Gln Arg Gln Leu
100 105 110

Leu Lys Asn Ile Lys Arg Arg Asn Pro Phe Thr Pro Ser Ser Ser Pro
115 120 125

Ser His Asp Ala Cys Asn Glu Leu Arg Arg Glu Lys Gln Val Leu Met
130 135 140

Met Glu Ile Val Ser Leu Arg Gln Gln Gln Gln Thr Thr Lys Ser Tyr
145 150 155 160

Ile Lys Ala Met Glu Gln Arg Ile Glu Gly Thr Glu Arg Lys Gln Arg
165 170 175

Gln Met Met Ser Phe Leu Ala Arg Ala Met Gln Ser Pro Ser Phe Leu
180 185 190

His Gln Leu Leu Lys Gln Arg Asp Lys Lys Ile Lys Glu Leu Glu Asp
195 200 205

Asn Glu Ser Ala Lys Arg Lys Arg Gly Ser Ser Ser Met Ser Glu Leu
210 215 220

Glu Val Leu Ala Leu Glu Met Gln Gly His Gly Lys Gln Arg Asn Met
225 230 235 240

Leu Glu Glu Glu Asp His Gln Leu Val Val Glu Arg Glu Leu Asp Asp
245 250 255

Gly Phe Trp Glu Glu Leu Leu Ser Asp Glu Ser Leu Ala Ser Thr Ser
260 265 270

<210> 141 <211> 2214 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (218)..(2077) <223> G849

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tctaattttt cctttgtaca ttgttttata tatacataaa acacacaaat cgggtatggg     120

ggaatttggg ttttaagata gcgtgatctg taataataag tggttcgcga tcgtgatcaa     180

gaaactggtg gctgatagtg atatgcatat ttgagag atg gtg ttc aag aga aag      235
                                          Met Val Phe Lys Arg Lys
                                          1               5

tta gat tgc ctt tcc gtg gga ttt gat ttt ccc aac att ccc aga gct      283
Leu Asp Cys Leu Ser Val Gly Phe Asp Phe Pro Asn Ile Pro Arg Ala
            10                  15                  20

cct cgt tca tgc agg agg aag gtt cta aac aag agg att gat cat gat      331
Pro Arg Ser Cys Arg Arg Lys Val Leu Asn Lys Arg Ile Asp His Asp
        25                  30                  35

gat gat aac act cag atc tgt gca att gac tta cta gct ttg gct gga      379
Asp Asp Asn Thr Gln Ile Cys Ala Ile Asp Leu Leu Ala Leu Ala Gly
    40                  45                  50

aag att cta cag gaa agc gag agt tcc tct gcg tct tct aat gca ttt      427
Lys Ile Leu Gln Glu Ser Glu Ser Ser Ser Ala Ser Ser Asn Ala Phe
55                  60                  65                  70

gaa gaa att aag caa gag aaa gta gaa aat tgc aag act att aaa tct      475
Glu Glu Ile Lys Gln Glu Lys Val Glu Asn Cys Lys Thr Ile Lys Ser
                75                  80                  85

gag tct tct gac caa gga aac tct gtg tca aag cct act tat gat atc      523
Glu Ser Ser Asp Gln Gly Asn Ser Val Ser Lys Pro Thr Tyr Asp Ile
            90                  95                  100

tct act gag aag tgt gtg gtg aac agt tgt ttt tca ttt ccg gat agt      571
Ser Thr Glu Lys Cys Val Val Asn Ser Cys Phe Ser Phe Pro Asp Ser
        105                 110                 115

gac ggc gtt ttg gag cgg act ccg atg tct gat tac aag aag att cat      619
Asp Gly Val Leu Glu Arg Thr Pro Met Ser Asp Tyr Lys Lys Ile His
    120                 125                 130

ggt ttg atg gat gta ggg tgt gaa aac aag aat gta aat aat ggg ttc      667
Gly Leu Met Asp Val Gly Cys Glu Asn Lys Asn Val Asn Asn Gly Phe
135                 140                 145                 150

gag caa gga gaa gca acc gat cgc gtg ggt gat gga ggc tta gtc act      715
Glu Gln Gly Glu Ala Thr Asp Arg Val Gly Asp Gly Gly Leu Val Thr
                155                 160                 165

gat act tgc aac tta gag gat gca act gcg tta ggt ctg cag ttt ccg      763
Asp Thr Cys Asn Leu Glu Asp Ala Thr Ala Leu Gly Leu Gln Phe Pro
            170                 175                 180

aaa tca gtc tgt gtg ggt ggt gat tta aaa tca cca tcc acc ttg gat      811
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Lys Ser Val Cys Val Gly Gly Asp Leu Lys Ser Pro Ser Thr Leu Asp
        185                 190                 195

atg acc cct aat ggt tcc tat gct aga cat ggg aac cat act aac cta      859
Met Thr Pro Asn Gly Ser Tyr Ala Arg His Gly Asn His Thr Asn Leu
    200                 205                 210

ggt aga aaa gat gat gat gaa aaa ttc tat agt tac cat aaa ctt agc      907
Gly Arg Lys Asp Asp Asp Glu Lys Phe Tyr Ser Tyr His Lys Leu Ser
215                 220                 225                 230

aat aaa ttt aag tcg tat agg tct cca aca att cga aga ata aga aag      955
Asn Lys Phe Lys Ser Tyr Arg Ser Pro Thr Ile Arg Arg Ile Arg Lys
                235                 240                 245

tcc atg tcg tcc aaa tac tgg aaa caa gtt cca aaa gat ttt gga tac     1003
Ser Met Ser Ser Lys Tyr Trp Lys Gln Val Pro Lys Asp Phe Gly Tyr
            250                 255                 260

agt aga gct gat gtg ggt gtg aag act ctt tat cgc aaa aga aaa tca     1051
Ser Arg Ala Asp Val Gly Val Lys Thr Leu Tyr Arg Lys Arg Lys Ser
        265                 270                 275

tgt tat ggt tac aac gca tgg cag cgt gag atc att tat aag aga aga     1099
Cys Tyr Gly Tyr Asn Ala Trp Gln Arg Glu Ile Ile Tyr Lys Arg Arg
    280                 285                 290

aga tca cct gac aga agc tcg gtc gta act tct gat gga gga ctc agt     1147
Arg Ser Pro Asp Arg Ser Ser Val Val Thr Ser Asp Gly Gly Leu Ser
295                 300                 305                 310

agt gga agt gtt tcc aag tta ccc aag aag gga gat aca gta aag cta     1195
Ser Gly Ser Val Ser Lys Leu Pro Lys Lys Gly Asp Thr Val Lys Leu
                315                 320                 325

agc att aag tcc ttt agg att cca gag ctt ttt att gaa gtt cca gaa     1243
Ser Ile Lys Ser Phe Arg Ile Pro Glu Leu Phe Ile Glu Val Pro Glu
            330                 335                 340

act gca aca gta gga tca cta aag agg act gtg atg gag gct gtc agt     1291
Thr Ala Thr Val Gly Ser Leu Lys Arg Thr Val Met Glu Ala Val Ser
        345                 350                 355

gtt tta ctc agc gga gga ata cgt gtt ggg gtg tta atg cat ggg aag     1339
Val Leu Leu Ser Gly Gly Ile Arg Val Gly Val Leu Met His Gly Lys
    360                 365                 370

aag gtt aga gat gaa agg aaa act ctg tcc cag act ggg atc tca tgt     1387
Lys Val Arg Asp Glu Arg Lys Thr Leu Ser Gln Thr Gly Ile Ser Cys
375                 380                 385                 390

gat gaa aat cta gac aac ctt ggg ttc acc ttg gag cct agt ccc agc     1435
Asp Glu Asn Leu Asp Asn Leu Gly Phe Thr Leu Glu Pro Ser Pro Ser
                395                 400                 405

aaa gtt ccc cta cct ttg tgt tct gaa gat cct gct gtg cca acc gac     1483
Lys Val Pro Leu Pro Leu Cys Ser Glu Asp Pro Ala Val Pro Thr Asp
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            410                 415                 420

cct aca agt ttg tct gaa cgg tct gcg gcg tct cct atg cta gat tct     1531
Pro Thr Ser Leu Ser Glu Arg Ser Ala Ala Ser Pro Met Leu Asp Ser
        425                 430                 435

gga att cca cat gca gat gac gtg att gat tca aga aat att gtg gac     1579
Gly Ile Pro His Ala Asp Asp Val Ile Asp Ser Arg Asn Ile Val Asp
    440                 445                 450

agt aac ctc gaa tta gtt cca tat cag ggt gac ata tct gtt gat gaa     1627
Ser Asn Leu Glu Leu Val Pro Tyr Gln Gly Asp Ile Ser Val Asp Glu
455                 460                 465                 470

cct tca tca gat tca aaa gag ctt gtc cca ctt cca gag ttg gaa gtc     1675
Pro Ser Ser Asp Ser Lys Glu Leu Val Pro Leu Pro Glu Leu Glu Val
                475                 480                 485

aag gcg ctt gcc ata gtt ccg ttg aac cag aaa cct aag cgt act gag     1723
Lys Ala Leu Ala Ile Val Pro Leu Asn Gln Lys Pro Lys Arg Thr Glu
            490                 495                 500

cta gcc cag agg aga act agg aga ccc ttc tct gtg aca gag gta gaa     1771
Leu Ala Gln Arg Arg Thr Arg Arg Pro Phe Ser Val Thr Glu Val Glu
        505                 510                 515

gct ctt gta caa gca gtt gag gaa ctc ggg act gga aga tgg cgt gat     1819
Ala Leu Val Gln Ala Val Glu Glu Leu Gly Thr Gly Arg Trp Arg Asp
    520                 525                 530

gta aaa ttg cgt gct ttc gag gat gca gat cat cgg act tac gtg gac     1867
Val Lys Leu Arg Ala Phe Glu Asp Ala Asp His Arg Thr Tyr Val Asp
535                 540                 545                 550

ttg aag gac aaa tgg aag acg cta gtt cac aca gca agt ata tcc cca     1915
Leu Lys Asp Lys Trp Lys Thr Leu Val His Thr Ala Ser Ile Ser Pro
                555                 560                 565

cag caa cga aga gga gag ccg gtg cca caa gaa ctg cta gac aga gtc     1963
Gln Gln Arg Arg Gly Glu Pro Val Pro Gln Glu Leu Leu Asp Arg Val
            570                 575                 580

ttg agg gca tac ggg tat tgg tcg cag cac caa gga aaa cat cag gcg     2011
Leu Arg Ala Tyr Gly Tyr Trp Ser Gln His Gln Gly Lys His Gln Ala
        585                 590                 595

aga gga gcg tcc aaa gat cca gac atg aac aga ggt gga gct ttt gaa     2059
Arg Gly Ala Ser Lys Asp Pro Asp Met Asn Arg Gly Gly Ala Phe Glu
    600                 605                 610

tca ggt gtt tca gtg taa aaaaggaggt acgcattggt gggtgggtgt           2107
Ser Gly Val Ser Val
615

acagaagcaa acaacacaat aaatggacaa ctcaatttct gcaaagttta attgtcttta   2167

tttctcgttt ttttttttt ttctcctaca tacacttttt ttttttct                2214
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35 40 45

Leu Leu Ala Leu Ala Gly Lys Ile Leu Gln Glu Ser Glu Ser Ser Ser
50 55 60

Ala Ser Ser Asn Ala Phe Glu Glu Ile Lys Gln Glu Lys Val Glu Asn
65 70 75 80

Cys Lys Thr Ile Lys Ser Glu Ser Ser Asp Gln Gly Asn Ser Val Ser
85 90 95

Lys Pro Thr Tyr Asp Ile Ser Thr Glu Lys Cys Val Val Asn Ser Cys
100 105 110

Phe Ser Phe Pro Asp Ser Asp Gly Val Leu Glu Arg Thr Pro Met Ser
115 120 125

Asp Tyr Lys Lys Ile His Gly Leu Met Asp Val Gly Cys Glu Asn Lys
130 135 140

Asn Val Asn Asn Gly Phe Glu Gln Gly Glu Ala Thr Asp Arg Val Gly
145 150 155 160

Asp Gly Gly Leu Val Thr Asp Thr Cys Asn Leu Glu Asp Ala Thr Ala
165 170 175

Leu Gly Leu Gln Phe Pro Lys Ser Val Cys Val Gly Gly Asp Leu Lys
180 185 190

Ser Pro Ser Thr Leu Asp Met Thr Pro Asn Gly Ser Tyr Ala Arg His
195 200 205

Gly Asn His Thr Asn Leu Gly Arg Lys Asp Asp Asp Glu Lys Phe Tyr

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Ser Tyr His Lys Leu Ser Asn Lys Phe Lys Ser Tyr Arg Ser Pro Thr
225                 230                 235                 240

Ile Arg Arg Ile Arg Lys Ser Met Ser Ser Lys Tyr Trp Lys Gln Val
                245                 250                 255

Pro Lys Asp Phe Gly Tyr Ser Arg Ala Asp Val Gly Val Lys Thr Leu
            260                 265                 270

Tyr Arg Lys Arg Lys Ser Cys Tyr Gly Tyr Asn Ala Trp Gln Arg Glu
        275                 280                 285

Ile Ile Tyr Lys Arg Arg Arg Ser Pro Asp Arg Ser Ser Val Val Thr
    290                 295                 300

Ser Asp Gly Gly Leu Ser Ser Gly Ser Val Ser Lys Leu Pro Lys Lys
305                 310                 315                 320

Gly Asp Thr Val Lys Leu Ser Ile Lys Ser Phe Arg Ile Pro Glu Leu
                325                 330                 335

Phe Ile Glu Val Pro Glu Thr Ala Thr Val Gly Ser Leu Lys Arg Thr
            340                 345                 350

Val Met Glu Ala Val Ser Val Leu Leu Ser Gly Gly Ile Arg Val Gly
        355                 360                 365

Val Leu Met His Gly Lys Lys Val Arg Asp Glu Arg Lys Thr Leu Ser
    370                 375                 380

Gln Thr Gly Ile Ser Cys Asp Glu Asn Leu Asp Asn Leu Gly Phe Thr
385                 390                 395                 400

Leu Glu Pro Ser Pro Ser Lys Val Pro Leu Pro Leu Cys Ser Glu Asp
                405                 410                 415

Pro Ala Val Pro Thr Asp Pro Thr Ser Leu Ser Glu Arg Ser Ala Ala
            420                 425                 430

Ser Pro Met Leu Asp Ser Gly Ile Pro His Ala Asp Asp Val Ile Asp
        435                 440                 445
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Ser Arg Asn Ile Val Asp Ser Asn Leu Glu Leu Val Pro Tyr Gln Gly
450 455 460

Asp Ile Ser Val Asp Glu Pro Ser Ser Asp Ser Lys Glu Leu Val Pro
465 470 475 480

Leu Pro Glu Leu Glu Val Lys Ala Leu Ala Ile Val Pro Leu Asn Gln
485 490 495

Lys Pro Lys Arg Thr Glu Leu Ala Gln Arg Arg Thr Arg Arg Pro Phe
500 505 510

Ser Val Thr Glu Val Glu Ala Leu Val Gln Ala Val Glu Glu Leu Gly
515 520 525

Thr Gly Arg Trp Arg Asp Val Lys Leu Arg Ala Phe Glu Asp Ala Asp
530 535 540

His Arg Thr Tyr Val Asp Leu Lys Asp Lys Trp Lys Thr Leu Val His
545 550 555 560

Thr Ala Ser Ile Ser Pro Gln Gln Arg Arg Gly Glu Pro Val Pro Gln
565 570 575

Glu Leu Leu Asp Arg Val Leu Arg Ala Tyr Gly Tyr Trp Ser Gln His
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Met Ser Asn
1

aat aat aat tct ccg acc acc gtg aat caa gaa acg acg acg tct cgt 164

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Asn Asn Asn Ser Pro Thr Thr Val Asn Gln Glu Thr Thr Thr Ser Arg
    5                  10                  15

gaa gtc tca atc aca ttg cct act gat caa tct cct caa acc tca cca      212
Glu Val Ser Ile Thr Leu Pro Thr Asp Gln Ser Pro Gln Thr Ser Pro
20                  25                  30                  35

gga tca tct tct tct cct tca ccg aga cct tcc ggt gga tca ccg gcg      260
Gly Ser Ser Ser Ser Pro Ser Pro Arg Pro Ser Gly Gly Ser Pro Ala
                40                  45                  50

aga aga acg gcg act gga tta tcc ggc aag cac tct att ttc agg ggg      308
Arg Arg Thr Ala Thr Gly Leu Ser Gly Lys His Ser Ile Phe Arg Gly
            55                  60                  65

att cga cta cgt aac gga aaa tgg gta tcg gag att aga gag cca cgt      356
Ile Arg Leu Arg Asn Gly Lys Trp Val Ser Glu Ile Arg Glu Pro Arg
        70                  75                  80

aaa acg aca aga att tgg ctc ggg act tat ccg gta ccg gag atg gct      404
Lys Thr Thr Arg Ile Trp Leu Gly Thr Tyr Pro Val Pro Glu Met Ala
    85                  90                  95

gcc gcc gct tac gac gtg gct gcg tta gct tta aaa gga ccc gac gcc      452
Ala Ala Ala Tyr Asp Val Ala Ala Leu Ala Leu Lys Gly Pro Asp Ala
100                 105                 110                 115

gtt ttg aat ttt cct ggt tta gct ttg act tac gtg gct ccg gtt tca      500
Val Leu Asn Phe Pro Gly Leu Ala Leu Thr Tyr Val Ala Pro Val Ser
                120                 125                 130

aac tct gct gcg gat ata aga gcg gct gct agt aga gca gcg gag atg      548
Asn Ser Ala Ala Asp Ile Arg Ala Ala Ala Ser Arg Ala Ala Glu Met
            135                 140                 145

aag caa ccg gat cag ggt ggg gat gag aag gta ttg gaa ccg gtt caa      596
Lys Gln Pro Asp Gln Gly Gly Asp Glu Lys Val Leu Glu Pro Val Gln
        150                 155                 160

ccc ggc aaa gag gaa gaa tta gaa gaa gtg tcg tgt aac tcg tgt tcg      644
Pro Gly Lys Glu Glu Glu Leu Glu Glu Val Ser Cys Asn Ser Cys Ser
    165                 170                 175

ttg gag ttt atg gat gag gaa gcg atg ttg aat atg ccg act ttg ttg      692
Leu Glu Phe Met Asp Glu Glu Ala Met Leu Asn Met Pro Thr Leu Leu
180                 185                 190                 195

acg gag atg gct gaa ggg atg ttg atg agt cca ccg aga atg atg ata      740
Thr Glu Met Ala Glu Gly Met Leu Met Ser Pro Pro Arg Met Met Ile
                200                 205                 210

cat ccg acg atg gaa gat gat tcg ccg gag aat cat gaa gga gat aat      788
His Pro Thr Met Glu Asp Asp Ser Pro Glu Asn His Glu Gly Asp Asn
            215                 220                 225

ctt tgg agt tat aaa tga atccattgaa gctgctctct tttttattgt             836
Leu Trp Ser Tyr Lys
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35 40 45

Ser Pro Ala Arg Arg Thr Ala Thr Gly Leu Ser Gly Lys His Ser Ile
50 55 60

Phe Arg Gly Ile Arg Leu Arg Asn Gly Lys Trp Val Ser Glu Ile Arg
65 70 75 80

Glu Pro Arg Lys Thr Thr Arg Ile Trp Leu Gly Thr Tyr Pro Val Pro
85 90 95

Glu Met Ala Ala Ala Ala Tyr Asp Val Ala Ala Leu Ala Leu Lys Gly
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Pro Asp Ala Val Leu Asn Phe Pro Gly Leu Ala Leu Thr Tyr Val Ala
115 120 125

Pro Val Ser Asn Ser Ala Ala Asp Ile Arg Ala Ala Ala Ser Arg Ala
130 135 140

Ala Glu Met Lys Gln Pro Asp Gln Gly Gly Asp Glu Lys Val Leu Glu
145 150 155 160

Pro Val Gln Pro Gly Lys Glu Glu Glu Leu Glu Glu Val Ser Cys Asn
165 170 175

Ser Cys Ser Leu Glu Phe Met Asp Glu Glu Ala Met Leu Asn Met Pro
180 185 190

Thr Leu Leu Thr Glu Met Ala Glu Gly Met Leu Met Ser Pro Pro Arg
195 200 205

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Gly Asp Asn Leu Trp Ser Tyr Lys
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                                                              Met
                                                               1

gat cag tac tca tcc tct ttg gtc gat act tca tta gat ctc act att      166
Asp Gln Tyr Ser Ser Ser Leu Val Asp Thr Ser Leu Asp Leu Thr Ile
            5                  10                  15

ggc gtt act cgt atg cga gtt gaa gaa gat cca ccg aca agt gct ttg      214
Gly Val Thr Arg Met Arg Val Glu Glu Asp Pro Pro Thr Ser Ala Leu
        20                  25                  30

gtg gaa gaa tta aac cga gtt agt gct gag aac aag aag ctc tcg gag      262
Val Glu Glu Leu Asn Arg Val Ser Ala Glu Asn Lys Lys Leu Ser Glu
    35                  40                  45

atg cta act ttg atg tgt gac aac tac aac gtc ttg agg aag caa ctt      310
Met Leu Thr Leu Met Cys Asp Asn Tyr Asn Val Leu Arg Lys Gln Leu
50                  55                  60                  65

atg gaa tat gtt aac aag agc aac ata acc gag agg gat caa atc agc      358
Met Glu Tyr Val Asn Lys Ser Asn Ile Thr Glu Arg Asp Gln Ile Ser
                70                  75                  80

cct ccc aag aaa cgc aaa tcc ccg gcg aga gag gac gca ttc agc tgc      406
Pro Pro Lys Lys Arg Lys Ser Pro Ala Arg Glu Asp Ala Phe Ser Cys
            85                  90                  95

gcg gtt att ggc gga gtg tcg gag agt agc tca acg gat caa gat gag      454
Ala Val Ile Gly Gly Val Ser Glu Ser Ser Ser Thr Asp Gln Asp Glu
        100                 105                 110

tat ttg tgt aag aag cag aga gaa gag act gtc gtg aag gag aaa gtc      502
Tyr Leu Cys Lys Lys Gln Arg Glu Glu Thr Val Val Lys Glu Lys Val
    115                 120                 125

tca agg gtc tat tac aag acc gaa gct tct gac act acc ctc gtt gtg      550
Ser Arg Val Tyr Tyr Lys Thr Glu Ala Ser Asp Thr Thr Leu Val Val
130                 135                 140                 145

aaa gat ggg tat caa tgg agg aaa tat gga cag aaa gtg act aga gac      598
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Lys Asp Gly Tyr Gln Trp Arg Lys Tyr Gly Gln Lys Val Thr Arg Asp
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Asn Pro Ser Pro Arg Ala Tyr Phe Lys Cys Ala Cys Ala Pro Ser Cys
            165                 170                 175

tct gtc aaa aag aag gtt cag aga agt gtg gag gat cag tcc gtg tta      694
Ser Val Lys Lys Lys Val Gln Arg Ser Val Glu Asp Gln Ser Val Leu
        180                 185                 190

gtt gca act tat gag ggt gaa cac aac cat cca atg cca tcg cag atc      742
Val Ala Thr Tyr Glu Gly Glu His Asn His Pro Met Pro Ser Gln Ile
    195                 200                 205

gat tca aac aat ggc tta aac cgc cac atc tct cat ggt ggt tca gct      790
Asp Ser Asn Asn Gly Leu Asn Arg His Ile Ser His Gly Gly Ser Ala
210                 215                 220                 225

tca aca ccc gtt gca gca aac aga aga agt agc ttg act gtg ccg gtg      838
Ser Thr Pro Val Ala Ala Asn Arg Arg Ser Ser Leu Thr Val Pro Val
                230                 235                 240

act acc gta gat atg att gaa tcg aag aaa gtg acg agc cca acg tca      886
Thr Thr Val Asp Met Ile Glu Ser Lys Lys Val Thr Ser Pro Thr Ser
            245                 250                 255

aga atc gat ttt ccc caa gtt cag aaa ctt ttg gtg gag caa atg gct      934
Arg Ile Asp Phe Pro Gln Val Gln Lys Leu Leu Val Glu Gln Met Ala
        260                 265                 270

tct tcc tta acc aaa gat cct aac ttt aca gca gct tta gca gca gct      982
Ser Ser Leu Thr Lys Asp Pro Asn Phe Thr Ala Ala Leu Ala Ala Ala
    275                 280                 285

gtt acc gga aaa ttg tat caa cag aat cat acc gag aaa tag             1024
Val Thr Gly Lys Leu Tyr Gln Gln Asn His Thr Glu Lys
290                 295                 300

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            20                  25                  30

Leu Val Glu Glu Leu Asn Arg Val Ser Ala Glu Asn Lys Lys Leu Ser
        35                  40                  45
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Glu Met Leu Thr Leu Met Cys Asp Asn Tyr Asn Val Leu Arg Lys Gln
50 55 60

Leu Met Glu Tyr Val Asn Lys Ser Asn Ile Thr Glu Arg Asp Gln Ile
65 70 75 80

Ser Pro Pro Lys Lys Arg Lys Ser Pro Ala Arg Glu Asp Ala Phe Ser
85 90 95

Cys Ala Val Ile Gly Gly Val Ser Glu Ser Ser Ser Thr Asp Gln Asp
100 105 110

Glu Tyr Leu Cys Lys Lys Gln Arg Glu Glu Thr Val Val Lys Glu Lys
115 120 125

Val Ser Arg Val Tyr Tyr Lys Thr Glu Ala Ser Asp Thr Thr Leu Val
130 135 140

Val Lys Asp Gly Tyr Gln Trp Arg Lys Tyr Gly Gln Lys Val Thr Arg
145 150 155 160

Asp Asn Pro Ser Pro Arg Ala Tyr Phe Lys Cys Ala Cys Ala Pro Ser
165 170 175

Cys Ser Val Lys Lys Lys Val Gln Arg Ser Val Glu Asp Gln Ser Val
180 185 190

Leu Val Ala Thr Tyr Glu Gly Glu His Asn His Pro Met Pro Ser Gln
195 200 205

Ile Asp Ser Asn Asn Gly Leu Asn Arg His Ile Ser His Gly Gly Ser
210 215 220

Ala Ser Thr Pro Val Ala Ala Asn Arg Arg Ser Ser Leu Thr Val Pro
225 230 235 240

Val Thr Thr Val Asp Met Ile Glu Ser Lys Lys Val Thr Ser Pro Thr
245 250 255

Ser Arg Ile Asp Phe Pro Gln Val Gln Lys Leu Leu Val Glu Gln Met
260 265 270

Ala Ser Ser Leu Thr Lys Asp Pro Asn Phe Thr Ala Ala Leu Ala Ala
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gtt tgt agc tcg gcg cct cca ttt aca gag gga cat atg tgt tct gat 98
Val Cys Ser Ser Ala Pro Pro Phe Thr Glu Gly His Met Cys Ser Asp
15 20 25 30

tcg cat acg gct ttg tgc gat gat ctg agt agt gat gag gaa atg gaa 146
Ser His Thr Ala Leu Cys Asp Asp Leu Ser Ser Asp Glu Glu Met Glu
35 40 45

ata gag gag ctt gag aag aag atc tgg aga gac aag cag cgt tta aag 194
Ile Glu Glu Leu Glu Lys Lys Ile Trp Arg Asp Lys Gln Arg Leu Lys
50 55 60

cgg ctc aag gaa atg gcg aag aac ggt cta gga aca aga ttg ttg ttg 242
Arg Leu Lys Glu Met Ala Lys Asn Gly Leu Gly Thr Arg Leu Leu Leu
65 70 75

aag cag caa cat gat gat ttt cca gag cac tct agt aag aga acc atg 290
Lys Gln Gln His Asp Asp Phe Pro Glu His Ser Ser Lys Arg Thr Met
80 85 90

tac aag gca caa gat ggg atc ttg aag tac atg tcg aag aca atg gag 338
Tyr Lys Ala Gln Asp Gly Ile Leu Lys Tyr Met Ser Lys Thr Met Glu
95 100 105 110

cga tat aaa gct caa ggt ttt gtt tat ggg att gtg tta gag aat ggg 386
Arg Tyr Lys Ala Gln Gly Phe Val Tyr Gly Ile Val Leu Glu Asn Gly
115 120 125

aaa acg gta gcg gga tct tct gat aat ctc cgt gaa tgg tgg aaa gac 434
Lys Thr Val Ala Gly Ser Ser Asp Asn Leu Arg Glu Trp Trp Lys Asp
130 135 140

aaa gtg agg ttt gat agg aac ggc cca gct gct ata atc aag cac caa 482
Lys Val Arg Phe Asp Arg Asn Gly Pro Ala Ala Ile Ile Lys His Gln
145 150 155

agg gat atc aat ctt tct gat gga agt gat tca ggg tct gag gtt ggg 530
Arg Asp Ile Asn Leu Ser Asp Gly Ser Asp Ser Gly Ser Glu Val Gly
160 165 170

gat tct acc gca cag aag ttg ctt gag ctt caa gat act act ctt gga 578

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Asp Ser Thr Ala Gln Lys Leu Leu Glu Leu Gln Asp Thr Thr Leu Gly
175                 180                 185                 190

gct ctg tta tcg gct ctg ttt cct cac tgc aac cct cct cag agg cgg      626
Ala Leu Leu Ser Ala Leu Phe Pro His Cys Asn Pro Pro Gln Arg Arg
                195                 200                 205

ttt ccg ttg gag aaa ggc gtg aca ccg cca tgg tgg cca acg ggg aaa      674
Phe Pro Leu Glu Lys Gly Val Thr Pro Pro Trp Trp Pro Thr Gly Lys
            210                 215                 220

gaa gat tgg tgg gat caa ctg tct tta ccc gtt gat ttt cga ggt gtt      722
Glu Asp Trp Trp Asp Gln Leu Ser Leu Pro Val Asp Phe Arg Gly Val
        225                 230                 235

ccg cca cct tac aag aag cct cat gat ctc aag aag ctg tgg aaa att      770
Pro Pro Pro Tyr Lys Lys Pro His Asp Leu Lys Lys Leu Trp Lys Ile
    240                 245                 250

ggt gtt ttg att ggt gta atc aga cat atg gct tct gac att agc aac      818
Gly Val Leu Ile Gly Val Ile Arg His Met Ala Ser Asp Ile Ser Asn
255                 260                 265                 270

ata ccc aat ctc gtg aga cgg tct aga agt ttg cag gag aaa atg acg      866
Ile Pro Asn Leu Val Arg Arg Ser Arg Ser Leu Gln Glu Lys Met Thr
                275                 280                 285

tca aga gaa ggc gct tta tgg ctc gct gct ctt tac cga gaa aag gct      914
Ser Arg Glu Gly Ala Leu Trp Leu Ala Ala Leu Tyr Arg Glu Lys Ala
            290                 295                 300

att gtt gat caa ata gcc atg tct aga gaa aac aac aac act tct aac      962
Ile Val Asp Gln Ile Ala Met Ser Arg Glu Asn Asn Asn Thr Ser Asn
        305                 310                 315

ttt ctt gtt cct gca acc ggt gga gac cca gat gtt ttg ttt cct gaa     1010
Phe Leu Val Pro Ala Thr Gly Gly Asp Pro Asp Val Leu Phe Pro Glu
    320                 325                 330

tct aca gac tat gat gtt gaa ctg att ggt ggc act cat cgg acc aat     1058
Ser Thr Asp Tyr Asp Val Glu Leu Ile Gly Gly Thr His Arg Thr Asn
335                 340                 345                 350

cag cag tat cct gaa ttt gaa aac aac tac aac tgt gtt tac aag aga     1106
Gln Gln Tyr Pro Glu Phe Glu Asn Asn Tyr Asn Cys Val Tyr Lys Arg
                355                 360                 365

aag ttt gaa gaa gat ttt ggg atg cca atg cat cca aca ctc cta aca     1154
Lys Phe Glu Glu Asp Phe Gly Met Pro Met His Pro Thr Leu Leu Thr
            370                 375                 380

tgt gag aac agt ctc tgt cct tat agc caa cca cat atg gga ttt ctt     1202
Cys Glu Asn Ser Leu Cys Pro Tyr Ser Gln Pro His Met Gly Phe Leu
        385                 390                 395

gac agg aac tta aga gag aat cac caa atg act tgt cct tat aaa gtc     1250
Asp Arg Asn Leu Arg Glu Asn His Gln Met Thr Cys Pro Tyr Lys Val
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    400                 405                 410

act tcc ttc tac caa cca act aaa ccc tat ggt atg acg ggt tta atg     1298
Thr Ser Phe Tyr Gln Pro Thr Lys Pro Tyr Gly Met Thr Gly Leu Met
415                 420                 425                 430

gtt cct tgt ccg gat tat aac ggg atg cag cag cag gtt cag agc ttt     1346
Val Pro Cys Pro Asp Tyr Asn Gly Met Gln Gln Gln Val Gln Ser Phe
                435                 440                 445

caa gac cag ttt aat cat ccc aac gat ctc tac aga cca aaa gct cca     1394
Gln Asp Gln Phe Asn His Pro Asn Asp Leu Tyr Arg Pro Lys Ala Pro
            450                 455                 460

caa aga ggc aac gat gac ttg gtt gag gat ttg aat cct tct cct tcg     1442
Gln Arg Gly Asn Asp Asp Leu Val Glu Asp Leu Asn Pro Ser Pro Ser
        465                 470                 475

acg ctg aat cag aat ctt ggt tta gtc tta cct act gac ttc aat gga     1490
Thr Leu Asn Gln Asn Leu Gly Leu Val Leu Pro Thr Asp Phe Asn Gly
    480                 485                 490

ggt gag gaa aca gta gga aca gag aac aat ctg cat aat caa ggg caa     1538
Gly Glu Glu Thr Val Gly Thr Glu Asn Asn Leu His Asn Gln Gly Gln
495                 500                 505                 510

gag ttg ccc aca tct tgg att cag taa agaaagcttc agagttttct           1585
Glu Leu Pro Thr Ser Trp Ile Gln
                515

ttttatgttt tctagtcttt atagctttgt ctcttgctta ttctctcatt aaacacagtt   1645

tttgatctct ccatttcata gcccatgtag caatggagaa gattaggttt cataataagt   1705

taataaccaa attcaaa                                                 1722
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Met Asp Met Tyr Asn Asn Asn Ile Gly Met Phe Arg Ser Leu Val Cys
1               5                   10                  15

Ser Ser Ala Pro Pro Phe Thr Glu Gly His Met Cys Ser Asp Ser His
            20                  25                  30

Thr Ala Leu Cys Asp Asp Leu Ser Ser Asp Glu Glu Met Glu Ile Glu
        35                  40                  45

Glu Leu Glu Lys Lys Ile Trp Arg Asp Lys Gln Arg Leu Lys Arg Leu
    50                  55                  60

Lys Glu Met Ala Lys Asn Gly Leu Gly Thr Arg Leu Leu Leu Lys Gln
65                  70                  75                  80
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Gln His Asp Asp Phe Pro Glu His Ser Ser Lys Arg Thr Met Tyr Lys
85 90 95

Ala Gln Asp Gly Ile Leu Lys Tyr Met Ser Lys Thr Met Glu Arg Tyr
100 105 110

Lys Ala Gln Gly Phe Val Tyr Gly Ile Val Leu Glu Asn Gly Lys Thr
115 120 125

Val Ala Gly Ser Ser Asp Asn Leu Arg Glu Trp Trp Lys Asp Lys Val
130 135 140

Arg Phe Asp Arg Asn Gly Pro Ala Ala Ile Ile Lys His Gln Arg Asp
145 150 155 160

Ile Asn Leu Ser Asp Gly Ser Asp Ser Gly Ser Glu Val Gly Asp Ser
165 170 175

Thr Ala Gln Lys Leu Leu Glu Leu Gln Asp Thr Thr Leu Gly Ala Leu
180 185 190

Leu Ser Ala Leu Phe Pro His Cys Asn Pro Pro Gln Arg Arg Phe Pro
195 200 205

Leu Glu Lys Gly Val Thr Pro Pro Trp Trp Pro Thr Gly Lys Glu Asp
210 215 220

Trp Trp Asp Gln Leu Ser Leu Pro Val Asp Phe Arg Gly Val Pro Pro
225 230 235 240

Pro Tyr Lys Lys Pro His Asp Leu Lys Lys Leu Trp Lys Ile Gly Val
245 250 255

Leu Ile Gly Val Ile Arg His Met Ala Ser Asp Ile Ser Asn Ile Pro
260 265 270

Asn Leu Val Arg Arg Ser Arg Ser Leu Gln Glu Lys Met Thr Ser Arg
275 280 285

Glu Gly Ala Leu Trp Leu Ala Ala Leu Tyr Arg Glu Lys Ala Ile Val
290 295 300

Asp Gln Ile Ala Met Ser Arg Glu Asn Asn Asn Thr Ser Asn Phe Leu
305 310 315 320

Val Pro Ala Thr Gly Gly Asp Pro Asp Val Leu Phe Pro Glu Ser Thr
325 330 335

Asp Tyr Asp Val Glu Leu Ile Gly Gly Thr His Arg Thr Asn Gln Gln
340 345 350

Tyr Pro Glu Phe Glu Asn Asn Tyr Asn Cys Val Tyr Lys Arg Lys Phe
355 360 365

Glu Glu Asp Phe Gly Met Pro Met His Pro Thr Leu Leu Thr Cys Glu
370 375 380

Asn Ser Leu Cys Pro Tyr Ser Gln Pro His Met Gly Phe Leu Asp Arg
385 390 395 400

Asn Leu Arg Glu Asn His Gln Met Thr Cys Pro Tyr Lys Val Thr Ser
405 410 415

Phe Tyr Gln Pro Thr Lys Pro Tyr Gly Met Thr Gly Leu Met Val Pro
420 425 430

Cys Pro Asp Tyr Asn Gly Met Gln Gln Gln Val Gln Ser Phe Gln Asp
435 440 445

Gln Phe Asn His Pro Asn Asp Leu Tyr Arg Pro Lys Ala Pro Gln Arg
450 455 460

Gly Asn Asp Asp Leu Val Glu Asp Leu Asn Pro Ser Pro Ser Thr Leu
465 470 475 480

Asn Gln Asn Leu Gly Leu Val Leu Pro Thr Asp Phe Asn Gly Gly Glu
485 490 495

Glu Thr Val Gly Thr Glu Asn Asn Leu His Asn Gln Gly Gln Glu Leu
500 505 510

Pro Thr Ser Trp Ile Gln
515

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cagattatcg ttgttaaagg tttttgattg attttgttta a atg ggc gat ctt gct 116
Met Gly Asp Leu Ala
1 5

atg tcc gta gca gac atc agg atg gag aat gag cct gat gat tta gct 164
Met Ser Val Ala Asp Ile Arg Met Glu Asn Glu Pro Asp Asp Leu Ala
10 15 20

agt gat aat gtt gct gag att gat gtg agt gat gaa gag att gat gct 212
Ser Asp Asn Val Ala Glu Ile Asp Val Ser Asp Glu Glu Ile Asp Ala
25 30 35

gac gac ctt gag aga cgg atg tgg aaa gat cgt gtc agg ctt aaa aga 260
Asp Asp Leu Glu Arg Arg Met Trp Lys Asp Arg Val Arg Leu Lys Arg
40 45 50

atc aaa gag cga caa aaa gct ggc tct caa gga gct caa acg aag gag 308
Ile Lys Glu Arg Gln Lys Ala Gly Ser Gln Gly Ala Gln Thr Lys Glu
55 60 65

aca cct aag aaa atc tct gat caa gct cag agg aag aaa atg tct aga 356
Thr Pro Lys Lys Ile Ser Asp Gln Ala Gln Arg Lys Lys Met Ser Arg
70 75 80 85

gct caa gat ggt atc ctt aag tac atg ttg aag ctt atg gaa gtc tgc 404
Ala Gln Asp Gly Ile Leu Lys Tyr Met Leu Lys Leu Met Glu Val Cys
90 95 100

aaa gtt cgc ggg ttt gtc tat ggt ata ata ccg gaa aag ggc aag cct 452
Lys Val Arg Gly Phe Val Tyr Gly Ile Ile Pro Glu Lys Gly Lys Pro
105 110 115

gtg agt ggt tcc tct gac aat ata aga gct tgg tgg aaa gag aaa gtg 500
Val Ser Gly Ser Ser Asp Asn Ile Arg Ala Trp Trp Lys Glu Lys Val
120 125 130

aag ttt gat aag aac ggt cct gct gct att gct aaa tac gaa gag gag 548
Lys Phe Asp Lys Asn Gly Pro Ala Ala Ile Ala Lys Tyr Glu Glu Glu
135 140 145

tgt tta gcg ttt ggg aaa tct gat ggg aat agg aat tca cag ttt gtt 596
Cys Leu Ala Phe Gly Lys Ser Asp Gly Asn Arg Asn Ser Gln Phe Val
150 155 160 165

ctc cag gat ttg caa gat gct act tta ggg tct ttg tta tct tct ttg 644
Leu Gln Asp Leu Gln Asp Ala Thr Leu Gly Ser Leu Leu Ser Ser Leu
170 175 180

atg caa cat tgt gat cct cct caa agg aag tat ccg ttg gag aaa ggg 692
Met Gln His Cys Asp Pro Pro Gln Arg Lys Tyr Pro Leu Glu Lys Gly
185 190 195

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acg cct ccg cct tgg tgg cca acg ggg aat gaa gaa tgg tgg gtg aaa      740
Thr Pro Pro Pro Trp Trp Pro Thr Gly Asn Glu Glu Trp Trp Val Lys
        200                 205                 210

ctc ggt ctg cct aaa agc cag agt cct cct tac cga aaa cct cat gat      788
Leu Gly Leu Pro Lys Ser Gln Ser Pro Pro Tyr Arg Lys Pro His Asp
    215                 220                 225

ctc aag aag atg tgg aag gtt gga gtt tta acg gca gtg atc aat cat      836
Leu Lys Lys Met Trp Lys Val Gly Val Leu Thr Ala Val Ile Asn His
230                 235                 240                 245

atg tta cct gat att gca aag att aag agg cat gtt cgt cag tcg aaa      884
Met Leu Pro Asp Ile Ala Lys Ile Lys Arg His Val Arg Gln Ser Lys
                250                 255                 260

tgt tta cag gac aag atg aca gct aaa gag agt gcg att tgg ttg gcg      932
Cys Leu Gln Asp Lys Met Thr Ala Lys Glu Ser Ala Ile Trp Leu Ala
            265                 270                 275

gtt ttg aac caa gag gaa tct ttg att cag cag cct agc agt gac aat      980
Val Leu Asn Gln Glu Glu Ser Leu Ile Gln Gln Pro Ser Ser Asp Asn
        280                 285                 290

gga aac tcc aat gtg act gag aca cat cgt agg ggt aat aac gct gac     1028
Gly Asn Ser Asn Val Thr Glu Thr His Arg Arg Gly Asn Asn Ala Asp
    295                 300                 305

agg agg aaa cct gtg gtc aac agt gac agt gac tat gat gtt gat ggg     1076
Arg Arg Lys Pro Val Val Asn Ser Asp Ser Asp Tyr Asp Val Asp Gly
310                 315                 320                 325

aca gag gaa gct tca ggt tca gtt tca tct aaa gac agt aga aga aat     1124
Thr Glu Glu Ala Ser Gly Ser Val Ser Ser Lys Asp Ser Arg Arg Asn
                330                 335                 340

cag att caa aaa gaa caa cca aca gcc atc tca cat tca gta aga gat     1172
Gln Ile Gln Lys Glu Gln Pro Thr Ala Ile Ser His Ser Val Arg Asp
            345                 350                 355

caa gat aaa gca gag aaa cat cgc aga agg aaa aga cct cga att aga     1220
Gln Asp Lys Ala Glu Lys His Arg Arg Arg Lys Arg Pro Arg Ile Arg
        360                 365                 370

tcc gga act gtc aat cga caa gag gaa gaa caa cct gaa gct caa caa     1268
Ser Gly Thr Val Asn Arg Gln Glu Glu Glu Gln Pro Glu Ala Gln Gln
    375                 380                 385

aga aac atc tta cct gat atg aat cat gtt gat gcc cct ctg cta gaa     1316
Arg Asn Ile Leu Pro Asp Met Asn His Val Asp Ala Pro Leu Leu Glu
390                 395                 400                 405

tat aac atc aac ggt act cat caa gag gac gat gtt gtc gac cca aat     1364
Tyr Asn Ile Asn Gly Thr His Gln Glu Asp Asp Val Val Asp Pro Asn
                410                 415                 420
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att gcc tta gga cca gag gat aat ggt ctg gaa cta gtg gtt cct gag 1412
Ile Ala Leu Gly Pro Glu Asp Asn Gly Leu Glu Leu Val Val Pro Glu
425 430 435

ttc aat aac aac tat act tat ctt cca ctt gtt aat gaa caa act atg 1460
Phe Asn Asn Asn Tyr Thr Tyr Leu Pro Leu Val Asn Glu Gln Thr Met
440 445 450

atg cct gta gac gaa agg cca atg ctt tat gga cca aac cct aac caa 1508
Met Pro Val Asp Glu Arg Pro Met Leu Tyr Gly Pro Asn Pro Asn Gln
455 460 465

gag ctt caa ttt ggg tca ggg tac aac ttc tac aat ccc tct gca gtg 1556
Glu Leu Gln Phe Gly Ser Gly Tyr Asn Phe Tyr Asn Pro Ser Ala Val
470 475 480 485

ttt gta cat aac cag gaa gac gac att ctc cat aca cag ata gaa atg 1604
Phe Val His Asn Gln Glu Asp Asp Ile Leu His Thr Gln Ile Glu Met
490 495 500

aat aca caa gca cca cct cac aac agt ggg ttc gag gag gcc cca gga 1652
Asn Thr Gln Ala Pro Pro His Asn Ser Gly Phe Glu Glu Ala Pro Gly
505 510 515

gga gta ctt caa ccc ctt ggt tta ctc gga aat gaa gac ggt gta aca 1700
Gly Val Leu Gln Pro Leu Gly Leu Leu Gly Asn Glu Asp Gly Val Thr
520 525 530

ggg agt gag ttg cct cag tat cag agt ggc att ctg tct cca ttg act 1748
Gly Ser Glu Leu Pro Gln Tyr Gln Ser Gly Ile Leu Ser Pro Leu Thr
535 540 545

gac ttg gac ttt gac tat ggt ggt ttt ggt gat gat ttc tca tgg ttt 1796
Asp Leu Asp Phe Asp Tyr Gly Gly Phe Gly Asp Asp Phe Ser Trp Phe
550 555 560 565

gga gct tag tgtcttgcca ttttttttgg gagattacat agttcaaaag 1845
Gly Ala

gacatggcaa tagtctggct agtacagtta ctttctcttc ttcatttctt ctgatcttat 1905

attcttcctc tttttttctt ataatatttt cttagatttg ttaagagaaa caattttcct 1965

tttgaataag ttgccagaag aactgctttg cccgttgtaa tggtctctag ggaaagcagt 2025

tagcgtatca tcatttgtaa atttactgtg ag 2057

<210> 150 <211> 567 <212> PRT <213> Arabidopsis thaliana <400> 150

Met Gly Asp Leu Ala Met Ser Val Ala Asp Ile Arg Met Glu Asn Glu
1 5 10 15

Pro Asp Asp Leu Ala Ser Asp Asn Val Ala Glu Ile Asp Val Ser Asp
20 25 30

Glu Glu Ile Asp Ala Asp Asp Leu Glu Arg Arg Met Trp Lys Asp Arg
35 40 45

Val Arg Leu Lys Arg Ile Lys Glu Arg Gln Lys Ala Gly Ser Gln Gly
50 55 60

Ala Gln Thr Lys Glu Thr Pro Lys Lys Ile Ser Asp Gln Ala Gln Arg
65 70 75 80

Lys Lys Met Ser Arg Ala Gln Asp Gly Ile Leu Lys Tyr Met Leu Lys
85 90 95

Leu Met Glu Val Cys Lys Val Arg Gly Phe Val Tyr Gly Ile Ile Pro
100 105 110

Glu Lys Gly Lys Pro Val Ser Gly Ser Ser Asp Asn Ile Arg Ala Trp
115 120 125

Trp Lys Glu Lys Val Lys Phe Asp Lys Asn Gly Pro Ala Ala Ile Ala
130 135 140

Lys Tyr Glu Glu Glu Cys Leu Ala Phe Gly Lys Ser Asp Gly Asn Arg
145 150 155 160

Asn Ser Gln Phe Val Leu Gln Asp Leu Gln Asp Ala Thr Leu Gly Ser
165 170 175

Leu Leu Ser Ser Leu Met Gln His Cys Asp Pro Pro Gln Arg Lys Tyr
180 185 190

Pro Leu Glu Lys Gly Thr Pro Pro Pro Trp Trp Pro Thr Gly Asn Glu
195 200 205

Glu Trp Trp Val Lys Leu Gly Leu Pro Lys Ser Gln Ser Pro Pro Tyr
210 215 220

Arg Lys Pro His Asp Leu Lys Lys Met Trp Lys Val Gly Val Leu Thr
225 230 235 240

Ala Val Ile Asn His Met Leu Pro Asp Ile Ala Lys Ile Lys Arg His
245 250 255

Val Arg Gln Ser Lys Cys Leu Gln Asp Lys Met Thr Ala Lys Glu Ser
260 265 270

Ala Ile Trp Leu Ala Val Leu Asn Gln Glu Glu Ser Leu Ile Gln Gln
275 280 285

Pro Ser Ser Asp Asn Gly Asn Ser Asn Val Thr Glu Thr His Arg Arg
290 295 300

Gly Asn Asn Ala Asp Arg Arg Lys Pro Val Val Asn Ser Asp Ser Asp
305 310 315 320

Tyr Asp Val Asp Gly Thr Glu Glu Ala Ser Gly Ser Val Ser Ser Lys
325 330 335

Asp Ser Arg Arg Asn Gln Ile Gln Lys Glu Gln Pro Thr Ala Ile Ser
340 345 350

His Ser Val Arg Asp Gln Asp Lys Ala Glu Lys His Arg Arg Arg Lys
355 360 365

Arg Pro Arg Ile Arg Ser Gly Thr Val Asn Arg Gln Glu Glu Glu Gln
370 375 380

Pro Glu Ala Gln Gln Arg Asn Ile Leu Pro Asp Met Asn His Val Asp
385 390 395 400

Ala Pro Leu Leu Glu Tyr Asn Ile Asn Gly Thr His Gln Glu Asp Asp
405 410 415

Val Val Asp Pro Asn Ile Ala Leu Gly Pro Glu Asp Asn Gly Leu Glu
420 425 430

Leu Val Val Pro Glu Phe Asn Asn Asn Tyr Thr Tyr Leu Pro Leu Val
435 440 445

Asn Glu Gln Thr Met Met Pro Val Asp Glu Arg Pro Met Leu Tyr Gly
450 455 460

Pro Asn Pro Asn Gln Glu Leu Gln Phe Gly Ser Gly Tyr Asn Phe Tyr
465 470 475 480

Asn Pro Ser Ala Val Phe Val His Asn Gln Glu Asp Asp Ile Leu His
485 490 495

Thr Gln Ile Glu Met Asn Thr Gln Ala Pro Pro His Asn Ser Gly Phe
500 505 510

Glu Glu Ala Pro Gly Gly Val Leu Gln Pro Leu Gly Leu Leu Gly Asn
515 520 525

Glu Asp Gly Val Thr Gly Ser Glu Leu Pro Gln Tyr Gln Ser Gly Ile
530 535 540

Leu Ser Pro Leu Thr Asp Leu Asp Phe Asp Tyr Gly Gly Phe Gly Asp
545 550 555 560

Asp Phe Ser Trp Phe Gly Ala
565

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<222> (46)..(591) <223> G977

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Met Ala Arg Pro
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caa caa cgc ttt cga ggc gtt aga cag agg cat tgg ggc tct tgg gtc 105
Gln Gln Arg Phe Arg Gly Val Arg Gln Arg His Trp Gly Ser Trp Val
5 10 15 20

tcc gaa att cgt cac cct ctc ttg aaa aca aga atc tgg cta ggg acg 153
Ser Glu Ile Arg His Pro Leu Leu Lys Thr Arg Ile Trp Leu Gly Thr
25 30 35

ttt gag aca gcg gag gat gca gca agg gcc tac gac gag gcg gct agg 201
Phe Glu Thr Ala Glu Asp Ala Ala Arg Ala Tyr Asp Glu Ala Ala Arg
40 45 50

cta atg tgt ggc ccg aga gct cgt act aat ttc cca tac aac cct aat 249
Leu Met Cys Gly Pro Arg Ala Arg Thr Asn Phe Pro Tyr Asn Pro Asn
55 60 65

gcc att cct act tcc tct tcc aag ctt cta tca gca act ctt acc gct 297
Ala Ile Pro Thr Ser Ser Ser Lys Leu Leu Ser Ala Thr Leu Thr Ala
70 75 80

aaa ctc cac aaa tgc tac atg gct tct ctt caa atg acc aag caa acg 345
Lys Leu His Lys Cys Tyr Met Ala Ser Leu Gln Met Thr Lys Gln Thr
85 90 95 100

caa aca caa acg caa acg cag acc gca aga tca caa tcc gcg gac agt 393

Gln Thr Gln Thr Gln Thr Gln Thr Ala Arg Ser Gln Ser Ala Asp Ser
105 110 115

gac ggt gtg acg gct aac gaa agt cat ttg aac aga gga gta acg gag 441
Asp Gly Val Thr Ala Asn Glu Ser His Leu Asn Arg Gly Val Thr Glu
120 125 130

acg aca gag atc aag tgg gaa gat gga aat gcg aat atg caa cag aat 489
Thr Thr Glu Ile Lys Trp Glu Asp Gly Asn Ala Asn Met Gln Gln Asn
135 140 145

ttt agg cca ttg gag gaa gat cat atc gag caa atg att gag gag ctg 537
Phe Arg Pro Leu Glu Glu Asp His Ile Glu Gln Met Ile Glu Glu Leu
150 155 160

ctt cac tac ggt tcc att gag ctt tgc tct gtt tta cca act cag acg 585
Leu His Tyr Gly Ser Ile Glu Leu Cys Ser Val Leu Pro Thr Gln Thr
165 170 175 180

ctg tga gaaatggcct tgtcgtttta gcgtattctt ttcattttta tttttgtttc 641
Leu

cacaaaaacg gcgtcgtaag tgatgagagt agtagtgaga gaaggctaat ttcaagacat 701

tttgatctga attggcctct tttgaaacac tgattctagt ttctataaga gcaatcgatc 761

atatgctatg ttatgtatag tattataaaa aaatgttatt ttctgattaa aaaaaaaaaa 821

aaaaaaaaaa aa 833

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Met Ala Arg Pro Gln Gln Arg Phe Arg Gly Val Arg Gln Arg His Trp
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Gly Ser Trp Val Ser Glu Ile Arg His Pro Leu Leu Lys Thr Arg Ile
20 25 30

Trp Leu Gly Thr Phe Glu Thr Ala Glu Asp Ala Ala Arg Ala Tyr Asp
35 40 45

Glu Ala Ala Arg Leu Met Cys Gly Pro Arg Ala Arg Thr Asn Phe Pro
50 55 60

Tyr Asn Pro Asn Ala Ile Pro Thr Ser Ser Ser Lys Leu Leu Ser Ala
65 70 75 80

Thr Leu Thr Ala Lys Leu His Lys Cys Tyr Met Ala Ser Leu Gln Met
85 90 95

Thr Lys Gln Thr Gln Thr Gln Thr Gln Thr Gln Thr Ala Arg Ser Gln
100 105 110

Ser Ala Asp Ser Asp Gly Val Thr Ala Asn Glu Ser His Leu Asn Arg
115 120 125

Gly Val Thr Glu Thr Thr Glu Ile Lys Trp Glu Asp Gly Asn Ala Asn
130 135 140

Met Gln Gln Asn Phe Arg Pro Leu Glu Glu Asp His Ile Glu Gln Met
145 150 155 160

Ile Glu Glu Leu Leu His Tyr Gly Ser Ile Glu Leu Cys Ser Val Leu
165 170 175

Pro Thr Gln Thr Leu
180

<210> 153 <211> 1530 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (60)..(1352) <223> G979

<400> 153
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atg aag aag cgc tta acc act tcc act tgt tct tct tct cca tct tcc 107
Met Lys Lys Arg Leu Thr Thr Ser Thr Cys Ser Ser Ser Pro Ser Ser
1 5 10 15

tct gtt tct tct tct act act act tcc tct cct att cag tcg gag gct 155
Ser Val Ser Ser Ser Thr Thr Thr Ser Ser Pro Ile Gln Ser Glu Ala
20 25 30

cca agg cct aaa cga gcc aaa agg gct aag aaa tct tct cct tct ggt 203
Pro Arg Pro Lys Arg Ala Lys Arg Ala Lys Lys Ser Ser Pro Ser Gly
35 40 45

gat aaa tct cat aac ccg aca agc cct gct tct acc cga cgc agc tct 251
Asp Lys Ser His Asn Pro Thr Ser Pro Ala Ser Thr Arg Arg Ser Ser
50 55 60

atc tac aga gga gtc act aga cat aga tgg act ggg aga ttc gag gct 299
Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Phe Glu Ala
65 70 75 80

cat ctt tgg gac aaa agc tct tgg aat tcg att cag aac aag aaa ggc 347
His Leu Trp Asp Lys Ser Ser Trp Asn Ser Ile Gln Asn Lys Lys Gly
85 90 95

aaa caa gtt tat ctg gga gca tat gac agt gaa gaa gca gca gca cat 395
Lys Gln Val Tyr Leu Gly Ala Tyr Asp Ser Glu Glu Ala Ala Ala His

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                100                 105                 110

acg tac gat ctg gct gct ctc aag tac tgg gga ccc gac acc atc ttg      443
Thr Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Pro Asp Thr Ile Leu
        115                 120                 125

aat ttt ccg gca gag acg tac aca aag gaa ttg gaa gaa atg cag aga      491
Asn Phe Pro Ala Glu Thr Tyr Thr Lys Glu Leu Glu Glu Met Gln Arg
    130                 135                 140

gtg aca aag gaa gaa tat ttg gct tct ctc cgc cgc cag agc agt ggt      539
Val Thr Lys Glu Glu Tyr Leu Ala Ser Leu Arg Arg Gln Ser Ser Gly
145                 150                 155                 160

ttc tcc aga ggc gtc tct aaa tat cgc ggc gtc gct agg cat cac cac      587
Phe Ser Arg Gly Val Ser Lys Tyr Arg Gly Val Ala Arg His His His
                165                 170                 175

aac gga aga tgg gag gct cgg atc gga aga gtg ttt ggg aac aag tac      635
Asn Gly Arg Trp Glu Ala Arg Ile Gly Arg Val Phe Gly Asn Lys Tyr
            180                 185                 190

ttg tac ctc ggc acc tat aat acg cag gag gaa gct gct gca gca tat      683
Leu Tyr Leu Gly Thr Tyr Asn Thr Gln Glu Glu Ala Ala Ala Ala Tyr
        195                 200                 205

gac atg gct gcg att gag tat cga ggc gca aac gcg gtt act aat ttc      731
Asp Met Ala Ala Ile Glu Tyr Arg Gly Ala Asn Ala Val Thr Asn Phe
    210                 215                 220

gac att agt aat tac att gac cgg tta aag aag aaa ggt gtt ttc ccg      779
Asp Ile Ser Asn Tyr Ile Asp Arg Leu Lys Lys Lys Gly Val Phe Pro
225                 230                 235                 240

ttc cct gtg aac caa gct aac cat caa gag ggt att ctt gtt gaa gcc      827
Phe Pro Val Asn Gln Ala Asn His Gln Glu Gly Ile Leu Val Glu Ala
                245                 250                 255

aaa caa gaa gtt gaa acg aga gaa gcg aag gaa gag cct aga gaa gaa      875
Lys Gln Glu Val Glu Thr Arg Glu Ala Lys Glu Glu Pro Arg Glu Glu
            260                 265                 270

gtg aaa caa cag tac gtg gaa gaa cca ccg caa gaa gaa gaa gag aag      923
Val Lys Gln Gln Tyr Val Glu Glu Pro Pro Gln Glu Glu Glu Glu Lys
        275                 280                 285

gaa gaa gag aaa gca gag caa caa gaa gca gag att gta gga tat tca      971
Glu Glu Glu Lys Ala Glu Gln Gln Glu Ala Glu Ile Val Gly Tyr Ser
    290                 295                 300

gaa gaa gca gca gtg gtc aat tgc tgc ata gac tct tca acc ata atg     1019
Glu Glu Ala Ala Val Val Asn Cys Cys Ile Asp Ser Ser Thr Ile Met
305                 310                 315                 320

gaa atg gat cgt tgt ggg gac aac aat gag ctg gct tgg aac ttc tgt     1067
Glu Met Asp Arg Cys Gly Asp Asn Asn Glu Leu Ala Trp Asn Phe Cys
                325                 330                 335
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atg atg gat aca ggg ttt tct ccg ttt ttg act gat cag aat ctc gcg     1115
Met Met Asp Thr Gly Phe Ser Pro Phe Leu Thr Asp Gln Asn Leu Ala
            340                 345                 350

aat gag aat ccc ata gag tat ccg gag cta ttc aat gag tta gca ttt     1163
Asn Glu Asn Pro Ile Glu Tyr Pro Glu Leu Phe Asn Glu Leu Ala Phe
        355                 360                 365

gag gac aac atc gac ttc atg ttc gat gat ggg aag cac gag tgc ttg     1211
Glu Asp Asn Ile Asp Phe Met Phe Asp Asp Gly Lys His Glu Cys Leu
    370                 375                 380

aac ttg gaa aat ctg gat tgt tgc gtg gtg gga aga gag agc cca ccc     1259
Asn Leu Glu Asn Leu Asp Cys Cys Val Val Gly Arg Glu Ser Pro Pro
385                 390                 395                 400

tct tct tct tca cca ttg tct tgc tta tct act gac tct gct tca tca     1307
Ser Ser Ser Ser Pro Leu Ser Cys Leu Ser Thr Asp Ser Ala Ser Ser
                405                 410                 415

aca aca aca aca aca acc tcg gtt tct tgt aac tat ttg gtc tga         1352
Thr Thr Thr Thr Thr Thr Ser Val Ser Cys Asn Tyr Leu Val
            420                 425                 430

gagagagagc tttgccttct agtttgaatt tctatttctt ccgcttcttc ttctttttt   1412

tcttttgttg ggttctgctt agggtttgta tttcagtttc agggcttgtt cgttggttct   1472

gaataatcaa tgtctttgcc ccttttaaaa agatacaaga aaaaaaaaaa aaaaaaaa     1530
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<210> 154 <211> 430 <212> PRT <213> Arabidopsis thaliana <400> 154

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Met Lys Lys Arg Leu Thr Thr Ser Thr Cys Ser Ser Ser Pro Ser Ser
1               5                   10                  15

Ser Val Ser Ser Ser Thr Thr Thr Ser Ser Pro Ile Gln Ser Glu Ala
            20                  25                  30

Pro Arg Pro Lys Arg Ala Lys Arg Ala Lys Lys Ser Ser Pro Ser Gly
        35                  40                  45

Asp Lys Ser His Asn Pro Thr Ser Pro Ala Ser Thr Arg Arg Ser Ser
    50                  55                  60

Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Phe Glu Ala
65                  70                  75                  80

His Leu Trp Asp Lys Ser Ser Trp Asn Ser Ile Gln Asn Lys Lys Gly
                85                  90                  95
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Lys Gln Val Tyr Leu Gly Ala Tyr Asp Ser Glu Glu Ala Ala Ala His
100 105 110

Thr Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Pro Asp Thr Ile Leu
115 120 125

Asn Phe Pro Ala Glu Thr Tyr Thr Lys Glu Leu Glu Glu Met Gln Arg
130 135 140

Val Thr Lys Glu Glu Tyr Leu Ala Ser Leu Arg Arg Gln Ser Ser Gly
145 150 155 160

Phe Ser Arg Gly Val Ser Lys Tyr Arg Gly Val Ala Arg His His His
165 170 175

Asn Gly Arg Trp Glu Ala Arg Ile Gly Arg Val Phe Gly Asn Lys Tyr
180 185 190

Leu Tyr Leu Gly Thr Tyr Asn Thr Gln Glu Glu Ala Ala Ala Ala Tyr
195 200 205

Asp Met Ala Ala Ile Glu Tyr Arg Gly Ala Asn Ala Val Thr Asn Phe
210 215 220

Asp Ile Ser Asn Tyr Ile Asp Arg Leu Lys Lys Lys Gly Val Phe Pro
225 230 235 240

Phe Pro Val Asn Gln Ala Asn His Gln Glu Gly Ile Leu Val Glu Ala
245 250 255

Lys Gln Glu Val Glu Thr Arg Glu Ala Lys Glu Glu Pro Arg Glu Glu
260 265 270

Val Lys Gln Gln Tyr Val Glu Glu Pro Pro Gln Glu Glu Glu Glu Lys
275 280 285

Glu Glu Glu Lys Ala Glu Gln Gln Glu Ala Glu Ile Val Gly Tyr Ser
290 295 300

Glu Glu Ala Ala Val Val Asn Cys Cys Ile Asp Ser Ser Thr Ile Met
305 310 315 320

Substitute Sheet (Rule 26)

```
Glu Met Asp Arg Cys Gly Asp Asn Asn Glu Leu Ala Trp Asn Phe Cys
                325                 330                 335

Met Met Asp Thr Gly Phe Ser Pro Phe Leu Thr Asp Gln Asn Leu Ala
            340                 345                 350

Asn Glu Asn Pro Ile Glu Tyr Pro Glu Leu Phe Asn Glu Leu Ala Phe
        355                 360                 365

Glu Asp Asn Ile Asp Phe Met Phe Asp Asp Gly Lys His Glu Cys Leu
    370                 375                 380

Asn Leu Glu Asn Leu Asp Cys Cys Val Val Gly Arg Glu Ser Pro Pro
385                 390                 395                 400

Ser Ser Ser Ser Pro Leu Ser Cys Leu Ser Thr Asp Ser Ala Ser Ser
                405                 410                 415

Thr Thr Thr Thr Thr Thr Ser Val Ser Cys Asn Tyr Leu Val
            420                 425                 430
```

09/29/2005 15:09:54

<210> 155 <211> 954 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(954) <223> G1000

<400> 155

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atg gga aga cct cct tgt tgt gac aag tcc aat gtc aag aaa ggt ctc       48
Met Gly Arg Pro Pro Cys Cys Asp Lys Ser Asn Val Lys Lys Gly Leu
1               5                   10                  15

tgg acc gag gaa gaa gac gct aag atc ctt gct tat gtt gct atc cat       96
Trp Thr Glu Glu Glu Asp Ala Lys Ile Leu Ala Tyr Val Ala Ile His
            20                  25                  30

ggt gta gga aac tgg agc ttg atc ccc aaa aaa gca ggt ctg aat cga      144
Gly Val Gly Asn Trp Ser Leu Ile Pro Lys Lys Ala Gly Leu Asn Arg
        35                  40                  45

tgt gga aag agc tgt aga cta aga tgg act aat tac tta aga cct gac      192
Cys Gly Lys Ser Cys Arg Leu Arg Trp Thr Asn Tyr Leu Arg Pro Asp
    50                  55                  60

ctt aaa cat gac agc ttc tct acc caa gaa gaa gag ctt atc att gag      240
Leu Lys His Asp Ser Phe Ser Thr Gln Glu Glu Glu Leu Ile Ile Glu
65                  70                  75                  80

tgt cat aga gcc att ggc agc agg tgg tct tcc att gca cga aag ctt      288
Cys His Arg Ala Ile Gly Ser Arg Trp Ser Ser Ile Ala Arg Lys Leu
                85                  90                  95

cca gga aga acg gat aat gat gtg aag aat cac tgg aac aca aag ctg      336
```

```
Pro Gly Arg Thr Asp Asn Asp Val Lys Asn His Trp Asn Thr Lys Leu
            100                 105                 110

aag aag aag ctg atg aaa atg ggg ata gac ccg gtg act cat aaa ccg      384
Lys Lys Lys Leu Met Lys Met Gly Ile Asp Pro Val Thr His Lys Pro
        115                 120                 125

gtt tct caa ctc ctt gca gaa ttc aga aac att agc ggc cat gga aat      432
Val Ser Gln Leu Leu Ala Glu Phe Arg Asn Ile Ser Gly His Gly Asn
    130                 135                 140

gca tcc ttc aaa aca gaa cca tct aac aac tct ata ctc aca caa tcc      480
Ala Ser Phe Lys Thr Glu Pro Ser Asn Asn Ser Ile Leu Thr Gln Ser
145                 150                 155                 160

aac tca gct tgg gaa atg atg aga aac aca aca aca aac cat gag agt      528
Asn Ser Ala Trp Glu Met Met Arg Asn Thr Thr Thr Asn His Glu Ser
                165                 170                 175

tat tac acc aac tct cca atg atg ttt aca aat tcc tct gag tac caa      576
Tyr Tyr Thr Asn Ser Pro Met Met Phe Thr Asn Ser Ser Glu Tyr Gln
            180                 185                 190

act act cca ttt cat ttc tat agc cat cca aat cat ctg ctc aat gga      624
Thr Thr Pro Phe His Phe Tyr Ser His Pro Asn His Leu Leu Asn Gly
        195                 200                 205

acc aca tct tca tgc tct tcc tca tca tct tct act agt atc act cag      672
Thr Thr Ser Ser Cys Ser Ser Ser Ser Ser Ser Thr Ser Ile Thr Gln
    210                 215                 220

cca aac caa gta cct caa aca ccg gtt act aac ttc tac tgg agc gat      720
Pro Asn Gln Val Pro Gln Thr Pro Val Thr Asn Phe Tyr Trp Ser Asp
225                 230                 235                 240

ttc ctt ctc tcg gac ccg gtt cct caa gta gtg gga tcc tca gct act      768
Phe Leu Leu Ser Asp Pro Val Pro Gln Val Val Gly Ser Ser Ala Thr
                245                 250                 255

agc gac ctc act ttt acg cag aac gaa cat cat ttc aac atc gaa gcc      816
Ser Asp Leu Thr Phe Thr Gln Asn Glu His His Phe Asn Ile Glu Ala
            260                 265                 270

gaa tac atc tct caa aac atc gat tca aag gcc tcg gga aca tgt cat      864
Glu Tyr Ile Ser Gln Asn Ile Asp Ser Lys Ala Ser Gly Thr Cys His
        275                 280                 285

tcc gcg agt tcc ttc gtt gac gaa ata cta gat aaa gac caa gag atg      912
Ser Ala Ser Ser Phe Val Asp Glu Ile Leu Asp Lys Asp Gln Glu Met
    290                 295                 300

ttg tca cag ttt cct caa ctc ttg aat gat ttc gat tat tag              954
Leu Ser Gln Phe Pro Gln Leu Leu Asn Asp Phe Asp Tyr
305                 310                 315
```

<210> 156 <211> 317 <212> PRT <213> Arabidopsis thaliana <400> 156

Met Gly Arg Pro Pro Cys Cys Asp Lys Ser Asn Val Lys Lys Gly Leu
1 5 10 15

Trp Thr Glu Glu Glu Asp Ala Lys Ile Leu Ala Tyr Val Ala Ile His
20 25 30

Gly Val Gly Asn Trp Ser Leu Ile Pro Lys Lys Ala Gly Leu Asn Arg
35 40 45

Cys Gly Lys Ser Cys Arg Leu Arg Trp Thr Asn Tyr Leu Arg Pro Asp
50 55 60

Leu Lys His Asp Ser Phe Ser Thr Gln Glu Glu Glu Leu Ile Ile Glu
65 70 75 80

Cys His Arg Ala Ile Gly Ser Arg Trp Ser Ser Ile Ala Arg Lys Leu
85 90 95

Pro Gly Arg Thr Asp Asn Asp Val Lys Asn His Trp Asn Thr Lys Leu
100 105 110

Lys Lys Lys Leu Met Lys Met Gly Ile Asp Pro Val Thr His Lys Pro
115 120 125

Val Ser Gln Leu Leu Ala Glu Phe Arg Asn Ile Ser Gly His Gly Asn
130 135 140

Ala Ser Phe Lys Thr Glu Pro Ser Asn Asn Ser Ile Leu Thr Gln Ser
145 150 155 160

Asn Ser Ala Trp Glu Met Met Arg Asn Thr Thr Thr Asn His Glu Ser
165 170 175

Tyr Tyr Thr Asn Ser Pro Met Met Phe Thr Asn Ser Ser Glu Tyr Gln
180 185 190

Thr Thr Pro Phe His Phe Tyr Ser His Pro Asn His Leu Leu Asn Gly
195 200 205

Thr Thr Ser Ser Cys Ser Ser Ser Ser Ser Ser Ser Thr Ser Ile Thr Gln
210 215 220

```
Pro Asn Gln Val Pro Gln Thr Pro Val Thr Asn Phe Tyr Trp Ser Asp
225                 230                 235                 240

Phe Leu Leu Ser Asp Pro Val Pro Gln Val Val Gly Ser Ser Ala Thr
                245                 250                 255

Ser Asp Leu Thr Phe Thr Gln Asn Glu His His Phe Asn Ile Glu Ala
            260                 265                 270

Glu Tyr Ile Ser Gln Asn Ile Asp Ser Lys Ala Ser Gly Thr Cys His
        275                 280                 285

Ser Ala Ser Ser Phe Val Asp Glu Ile Leu Asp Lys Asp Gln Glu Met
    290                 295                 300

Leu Ser Gln Phe Pro Gln Leu Leu Asn Asp Phe Asp Tyr
305                 310                 315
```

09/30/2005 09:09 PM

<210> 157 <211> 476 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (41)..(370) <223> G1012

<400> 157

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aacacacaat tcgttgattc atcatatctc ctcttcatta atg aat ggc ctc gtc       55
                                            Met Asn Gly Leu Val
                                            1               5

gac tct tct cga gat aag aag atg aaa aat ccg cga ttt tcg ttt cgc      103
Asp Ser Ser Arg Asp Lys Lys Met Lys Asn Pro Arg Phe Ser Phe Arg
                10                  15                  20

aca aag agt gat gca gat att ctc gat gat ggt tat cga tgg aga aag      151
Thr Lys Ser Asp Ala Asp Ile Leu Asp Asp Gly Tyr Arg Trp Arg Lys
            25                  30                  35

tac ggt cag aaa tcc gtc aag aac agc ttg tat ccc agg agc tat tat      199
Tyr Gly Gln Lys Ser Val Lys Asn Ser Leu Tyr Pro Arg Ser Tyr Tyr
        40                  45                  50

aga tgc aca caa cac atg tgt aac gtg aag aag caa gtt cag agg ctg      247
Arg Cys Thr Gln His Met Cys Asn Val Lys Lys Gln Val Gln Arg Leu
    55                  60                  65

tcg aag gag acg agc att gtg gag aca act tat gaa gga atc cat aac      295
Ser Lys Glu Thr Ser Ile Val Glu Thr Thr Tyr Glu Gly Ile His Asn
70                  75                  80                  85

cat cct tgt gag gag ctc atg caa acc cta act cct ctt ctt cat caa      343
His Pro Cys Glu Glu Leu Met Gln Thr Leu Thr Pro Leu Leu His Gln
                90                  95                  100

ttg cag ttc ctc tct aag ttc acc taa ttatgtttgt atatatatta            390
```

Leu Gln Phe Leu Ser Lys Phe Thr
105

acgttctaag agcatctcca atggaagtat ctcaatgaga tacctaacaa aagaaaaaaa 450

atttaaaaaa aaaaaaaaaa aaaaaa 476

<210> 158 <211> 109 <212> PRT <213> Arabidopsis thaliana <400> 158

Met Asn Gly Leu Val Asp Ser Ser Arg Asp Lys Lys Met Lys Asn Pro
1 5 10 15

Arg Phe Ser Phe Arg Thr Lys Ser Asp Ala Asp Ile Leu Asp Asp Gly
20 25 30

Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ser Val Lys Asn Ser Leu Tyr
35 40 45

Pro Arg Ser Tyr Tyr Arg Cys Thr Gln His Met Cys Asn Val Lys Lys
50 55 60

Gln Val Gln Arg Leu Ser Lys Glu Thr Ser Ile Val Glu Thr Thr Tyr
65 70 75 80

Glu Gly Ile His Asn His Pro Cys Glu Glu Leu Met Gln Thr Leu Thr
85 90 95

Pro Leu Leu His Gln Leu Gln Phe Leu Ser Lys Phe Thr
100 105

<210> 159 <211> 1257 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (174)..(1112) <223> G1014

<400> 159
cacaaaccac agtctctctt tctctctcta tctatcttct ctttctctct ctatctctat 60

cactgaaacc caaagagatc caccatttgt tctttttccc ttcacacaga gaactgtttt 120

cttccacact tccttttttac taggcagtgt taaccaattg agagagaaaa atg atg 176
Met
1

gtt gat gaa aat gtg gaa acc aag gcc tct act tta gtg gca agt gtt 224
Val Asp Glu Asn Val Glu Thr Lys Ala Ser Thr Leu Val Ala Ser Val
5 10 15

gat cat ggg ttt gga tcc ggg tcg ggt cat gat cat cat ggg tta tcg 272
Asp His Gly Phe Gly Ser Gly Ser Gly His Asp His His Gly Leu Ser
20 25 30

```
gcg tct gtg cct ctt ctt ggt gtt aac tgg aag aag aga agg atg cct      320
Ala Ser Val Pro Leu Leu Gly Val Asn Trp Lys Lys Arg Arg Met Pro
    35                  40                  45

aga cag aga cga tct tct tct tcc ttt aac ctt ctc tct ttc cct cct      368
Arg Gln Arg Arg Ser Ser Ser Ser Phe Asn Leu Leu Ser Phe Pro Pro
50                  55                  60                  65

cct atg cct cct att tcc cac gtg cca act cct ctc ccc gca cgt aaa      416
Pro Met Pro Pro Ile Ser His Val Pro Thr Pro Leu Pro Ala Arg Lys
                70                  75                  80

att gac cca aga aag cta aga ttc ctc ttc caa aag gaa ctc aag aac      464
Ile Asp Pro Arg Lys Leu Arg Phe Leu Phe Gln Lys Glu Leu Lys Asn
            85                  90                  95

agt gac gtc agc tct ctc cga cgt atg ata ctc ccg aag aaa gcc gcg      512
Ser Asp Val Ser Ser Leu Arg Arg Met Ile Leu Pro Lys Lys Ala Ala
        100                 105                 110

gag gct cac ttg ccg gca ctt gaa tgc aag gaa ggg att cct ata aga      560
Glu Ala His Leu Pro Ala Leu Glu Cys Lys Glu Gly Ile Pro Ile Arg
    115                 120                 125

atg gaa gat ttg gac ggt ttt cac gtt tgg acc ttc aag tat agg tac      608
Met Glu Asp Leu Asp Gly Phe His Val Trp Thr Phe Lys Tyr Arg Tyr
130                 135                 140                 145

tgg cca aac aac aat agc aga atg tac gtg cta gaa aac aca ggc gat      656
Trp Pro Asn Asn Asn Ser Arg Met Tyr Val Leu Glu Asn Thr Gly Asp
                150                 155                 160

ttt gtg aat gct cat ggt ctg cag cta ggt gac ttc atc atg gtt tac      704
Phe Val Asn Ala His Gly Leu Gln Leu Gly Asp Phe Ile Met Val Tyr
            165                 170                 175

caa gat ctc tac tca aac aat tac gtt ata caa gca aga aaa gca tcg      752
Gln Asp Leu Tyr Ser Asn Asn Tyr Val Ile Gln Ala Arg Lys Ala Ser
        180                 185                 190

gaa gaa gaa gaa gta gac gta atc aat ctt gaa gaa gac gac gtt tac      800
Glu Glu Glu Glu Val Asp Val Ile Asn Leu Glu Glu Asp Asp Val Tyr
    195                 200                 205

aca aac tta aca agg atc gaa aac act gtg gtt aac gat ctt ctc ctc      848
Thr Asn Leu Thr Arg Ile Glu Asn Thr Val Val Asn Asp Leu Leu Leu
210                 215                 220                 225

caa gat ttt aat cat cac aac aac aac aac aac aac aac agc aac agc      896
Gln Asp Phe Asn His His Asn Asn Asn Asn Asn Asn Asn Ser Asn Ser
                230                 235                 240

aac agc aac aaa tgt tct tac tat tat cca gtc ata gat gat gtc acc      944
Asn Ser Asn Lys Cys Ser Tyr Tyr Tyr Pro Val Ile Asp Asp Val Thr
            245                 250                 255
```

```
aca aac aca gag tct ttt gtc tac gac acg acg gct ctt acc tcc aac      992
Thr Asn Thr Glu Ser Phe Val Tyr Asp Thr Thr Ala Leu Thr Ser Asn
        260                 265                 270

gat act cct ctc gat ttt ttg ggt gga cat acg acg act act aat aat     1040
Asp Thr Pro Leu Asp Phe Leu Gly Gly His Thr Thr Thr Thr Asn Asn
    275                 280                 285

tat tac tcc aag ttc gga aca ttc gat ggt ttg ggc tcc gtt gag aat     1088
Tyr Tyr Ser Lys Phe Gly Thr Phe Asp Gly Leu Gly Ser Val Glu Asn
290                 295                 300                 305

atc tct ctc gat gac ttc tac tag ataatcaatc gatgggctca tggtattctt    1142
Ile Ser Leu Asp Asp Phe Tyr
                310

gatggtgatc agctatttaa tatccttata atatatataa gaattaaatg caatttgcat   1202

atatattatc aagtgttgta atataacatt acagtttaaa aaaaaaaaaa aaaaa        1257
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<210> 160 <211> 312 <212> PRT <213> Arabidopsis thaliana <400> 160

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Met Val Asp Glu Asn Val Glu Thr Lys Ala Ser Thr Leu Val Ala Ser
1               5                   10                  15

Val Asp His Gly Phe Gly Ser Gly Ser Gly His Asp His His Gly Leu
            20                  25                  30

Ser Ala Ser Val Pro Leu Leu Gly Val Asn Trp Lys Lys Arg Arg Met
        35                  40                  45

Pro Arg Gln Arg Arg Ser Ser Ser Ser Phe Asn Leu Leu Ser Phe Pro
    50                  55                  60

Pro Pro Met Pro Pro Ile Ser His Val Pro Thr Pro Leu Pro Ala Arg
65                  70                  75                  80

Lys Ile Asp Pro Arg Lys Leu Arg Phe Leu Phe Gln Lys Glu Leu Lys
                85                  90                  95

Asn Ser Asp Val Ser Ser Leu Arg Arg Met Ile Leu Pro Lys Lys Ala
            100                 105                 110

Ala Glu Ala His Leu Pro Ala Leu Glu Cys Lys Glu Gly Ile Pro Ile
        115                 120                 125

Arg Met Glu Asp Leu Asp Gly Phe His Val Trp Thr Phe Lys Tyr Arg
    130                 135                 140
```

```
Tyr Trp Pro Asn Asn Asn Ser Arg Met Tyr Val Leu Glu Asn Thr Gly
145                 150                 155                 160

Asp Phe Val Asn Ala His Gly Leu Gln Leu Gly Asp Phe Ile Met Val
                165                 170                 175

Tyr Gln Asp Leu Tyr Ser Asn Asn Tyr Val Ile Gln Ala Arg Lys Ala
            180                 185                 190

Ser Glu Glu Glu Glu Val Asp Val Ile Asn Leu Glu Glu Asp Asp Val
        195                 200                 205

Tyr Thr Asn Leu Thr Arg Ile Glu Asn Thr Val Val Asn Asp Leu Leu
    210                 215                 220

Leu Gln Asp Phe Asn His His Asn Asn Asn Asn Asn Asn Asn Ser Asn
225                 230                 235                 240

Ser Asn Ser Asn Lys Cys Ser Tyr Tyr Tyr Pro Val Ile Asp Asp Val
                245                 250                 255

Thr Thr Asn Thr Glu Ser Phe Val Tyr Asp Thr Thr Ala Leu Thr Ser
            260                 265                 270

Asn Asp Thr Pro Leu Asp Phe Leu Gly Gly His Thr Thr Thr Thr Asn
        275                 280                 285

Asn Tyr Tyr Ser Lys Phe Gly Thr Phe Asp Gly Leu Gly Ser Val Glu
    290                 295                 300

Asn Ile Ser Leu Asp Asp Phe Tyr
305                 310
```

<210> 161 <211> 1057 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (51)..(863) <223> G1040

<400> 161

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ctttgatctc cactatttaa gtagacaaga atcataaaga aaatagtgag atg atg        56
                                                        Met Met
                                                        1

atg tta gag tca aga aac agt atg aga gct tca aac tca gtc cca gat      104
Met Leu Glu Ser Arg Asn Ser Met Arg Ala Ser Asn Ser Val Pro Asp
        5                   10                  15
```

```
ctg tct ctt cag atc agt ctt cct aac tat cac gcc gga aaa cct ctt      152
Leu Ser Leu Gln Ile Ser Leu Pro Asn Tyr His Ala Gly Lys Pro Leu
    20                  25                  30

cac ggc ggt gac cgg agc tcc aca agc agt gat tct gga agc agc ctc      200
His Gly Gly Asp Arg Ser Ser Thr Ser Ser Asp Ser Gly Ser Ser Leu
35                  40                  45                  50

agt gac ctg agc cat gag aac aac ttc ttc aac aaa cct ctc ttg agc      248
Ser Asp Leu Ser His Glu Asn Asn Phe Phe Asn Lys Pro Leu Leu Ser
                55                  60                  65

tta gga ttt gac cat cat cat caa agg cgc tca aac atg ttc caa cct      296
Leu Gly Phe Asp His His His Gln Arg Arg Ser Asn Met Phe Gln Pro
            70                  75                  80

caa atc tac ggt cga gat ttc aag aga agc tca tca tca atg gtt ggt      344
Gln Ile Tyr Gly Arg Asp Phe Lys Arg Ser Ser Ser Ser Met Val Gly
        85                  90                  95

ctt aaa cga agc att cgt gct cca aga atg aga tgg act tct act ctt      392
Leu Lys Arg Ser Ile Arg Ala Pro Arg Met Arg Trp Thr Ser Thr Leu
    100                 105                 110

cat gct cac ttc gtc cat gct gtt caa ctt ctt ggc ggc cat gaa aga      440
His Ala His Phe Val His Ala Val Gln Leu Leu Gly Gly His Glu Arg
115                 120                 125                 130

gca acg cct aaa tca gtg ttg gag ctc atg aat gtg aag gat cta acc      488
Ala Thr Pro Lys Ser Val Leu Glu Leu Met Asn Val Lys Asp Leu Thr
                135                 140                 145

cta gct cat gtc aag agt cac ttg cag atg tat aga aca gtg aaa tgc      536
Leu Ala His Val Lys Ser His Leu Gln Met Tyr Arg Thr Val Lys Cys
            150                 155                 160

act gat aaa gga tca cca gga gaa gga aag gta gag aaa gag gca gag      584
Thr Asp Lys Gly Ser Pro Gly Glu Gly Lys Val Glu Lys Glu Ala Glu
        165                 170                 175

cag agg ata gag gac aat aat aat aat gaa gaa gct gat gaa gga act      632
Gln Arg Ile Glu Asp Asn Asn Asn Asn Glu Glu Ala Asp Glu Gly Thr
    180                 185                 190

gac aca aat tcg cca aac tca tca tct gtg caa aag acc caa aga gct      680
Asp Thr Asn Ser Pro Asn Ser Ser Ser Val Gln Lys Thr Gln Arg Ala
195                 200                 205                 210

tca tgg tca tcg aca aag gaa gta tct agg agc ata tct aca caa gca      728
Ser Trp Ser Ser Thr Lys Glu Val Ser Arg Ser Ile Ser Thr Gln Ala
                215                 220                 225

tat tct cac ttg gga aca act cat cac act aag gcc aat gaa gag aaa      776
Tyr Ser His Leu Gly Thr Thr His His Thr Lys Ala Asn Glu Glu Lys
            230                 235                 240
```

gag gat acc aac att cat ctc aat ttg gat ttc aca ttg ggc ggc cta 824
Glu Asp Thr Asn Ile His Leu Asn Leu Asp Phe Thr Leu Gly Gly Leu
245 250 255

gtt ggg gga tgg aat atg cgg aac cct cca gtg att taa cccttctcaa 873
Val Gly Gly Trp Asn Met Arg Asn Pro Pro Val Ile
260 265 270

gtgctaattg ccttaagcta caacaaataa gtcagcttag gttaccagtt ttaacataat 933

tttaacttgt tttgatcata tgagcttcgg aagaatcata ttatcatcat atatgaactt 993

ctttccaaga atgttctatg agtttttga tatgtataat caagagaatc gtttgaagta 1053

aaaa 1057

<210> 162 <211> 270 <212> PRT <213> Arabidopsis thaliana <400> 162

Met Met Met Leu Glu Ser Arg Asn Ser Met Arg Ala Ser Asn Ser Val
1 5 10 15

Pro Asp Leu Ser Leu Gln Ile Ser Leu Pro Asn Tyr His Ala Gly Lys
20 25 30

Pro Leu His Gly Gly Asp Arg Ser Ser Thr Ser Ser Asp Ser Gly Ser
35 40 45

Ser Leu Ser Asp Leu Ser His Glu Asn Asn Phe Phe Asn Lys Pro Leu
50 55 60

Leu Ser Leu Gly Phe Asp His His His Gln Arg Arg Ser Asn Met Phe
65 70 75 80

Gln Pro Gln Ile Tyr Gly Arg Asp Phe Lys Arg Ser Ser Ser Ser Met
85 90 95

Val Gly Leu Lys Arg Ser Ile Arg Ala Pro Arg Met Arg Trp Thr Ser
100 105 110

Thr Leu His Ala His Phe Val His Ala Val Gln Leu Leu Gly Gly His
115 120 125

Glu Arg Ala Thr Pro Lys Ser Val Leu Glu Leu Met Asn Val Lys Asp
130 135 140

Leu Thr Leu Ala His Val Lys Ser His Leu Gln Met Tyr Arg Thr Val
145 150 155 160

```
Lys Cys Thr Asp Lys Gly Ser Pro Gly Glu Gly Lys Val Glu Lys Glu
                165                 170                 175

Ala Glu Gln Arg Ile Glu Asp Asn Asn Asn Asn Glu Glu Ala Asp Glu
            180                 185                 190

Gly Thr Asp Thr Asn Ser Pro Asn Ser Ser Ser Val Gln Lys Thr Gln
        195                 200                 205

Arg Ala Ser Trp Ser Ser Thr Lys Glu Val Ser Arg Ser Ile Ser Thr
    210                 215                 220

Gln Ala Tyr Ser His Leu Gly Thr Thr His His Thr Lys Ala Asn Glu
225                 230                 235                 240

Glu Lys Glu Asp Thr Asn Ile His Leu Asn Leu Asp Phe Thr Leu Gly
                245                 250                 255

Gly Leu Val Gly Gly Trp Asn Met Arg Asn Pro Pro Val Ile
            260                 265                 270
```

<210> 163 <211> 1766 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (23)..(1582) <223> G1050

<400> 163

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ttccccattt cagaaaatca aa atg ggt ggt ggt ggt gat aca aca gat acc      52
                          Met Gly Gly Gly Gly Asp Thr Thr Asp Thr
                          1               5                   10

aat atg atg cag aga gtt aat tct tct tct ggt aca tcg tct tct tcg      100
Asn Met Met Gln Arg Val Asn Ser Ser Ser Gly Thr Ser Ser Ser Ser
                15                  20                  25

atc cct aaa cac aat ctt cac ttg aat cct gct ctt atc cgc tct cac      148
Ile Pro Lys His Asn Leu His Leu Asn Pro Ala Leu Ile Arg Ser His
            30                  35                  40

cat cac ttc cgt cac cct ttc acc gga gct cct cca ccg ccg att cca      196
His His Phe Arg His Pro Phe Thr Gly Ala Pro Pro Pro Pro Ile Pro
        45                  50                  55

ccc att tct cct tac tct cag atc ccg gcg act tta caa cct aga cat      244
Pro Ile Ser Pro Tyr Ser Gln Ile Pro Ala Thr Leu Gln Pro Arg His
    60                  65                  70

tct cgc tct atg tcg caa ccg tct tct ttc ttc tcc ttt gat tca ttg      292
Ser Arg Ser Met Ser Gln Pro Ser Ser Phe Phe Ser Phe Asp Ser Leu
75                  80                  85                  90
```

```
ccg ccg tta aat cct tct gct ccg tcg gtt tcg gtg tcg gtg gag gag      340
Pro Pro Leu Asn Pro Ser Ala Pro Ser Val Ser Val Ser Val Glu Glu
                95                  100                 105

aaa acc ggt gcc gga ttt agt cct tcg ttg cct ccg tca ccg ttt acg      388
Lys Thr Gly Ala Gly Phe Ser Pro Ser Leu Pro Pro Ser Pro Phe Thr
            110                 115                 120

atg tgt cat tct tct agc tct agg aac gcc gga gat gga gag aat cta      436
Met Cys His Ser Ser Ser Ser Arg Asn Ala Gly Asp Gly Glu Asn Leu
        125                 130                 135

cct ccg aga aag tcg cat agg cgt tcg aat agt gat gtt act ttt ggg      484
Pro Pro Arg Lys Ser His Arg Arg Ser Asn Ser Asp Val Thr Phe Gly
    140                 145                 150

ttt agt tca atg atg tct cag aat caa aag tct cct cct ttg agt tct      532
Phe Ser Ser Met Met Ser Gln Asn Gln Lys Ser Pro Pro Leu Ser Ser
155                 160                 165                 170

ttg gag aga tcg atc tct ggt gaa gat aca tca gat tgg tct aat ttg      580
Leu Glu Arg Ser Ile Ser Gly Glu Asp Thr Ser Asp Trp Ser Asn Leu
                175                 180                 185

gtg aag aaa gaa ccg aga gaa ggc ttc tac aag gga aga aaa cca gag      628
Val Lys Lys Glu Pro Arg Glu Gly Phe Tyr Lys Gly Arg Lys Pro Glu
            190                 195                 200

gtt gaa gca gct atg gac gat gtt ttc acg gct tat atg aat ctt gat      676
Val Glu Ala Ala Met Asp Asp Val Phe Thr Ala Tyr Met Asn Leu Asp
        205                 210                 215

aac att gat gtc ttg aat tct ttt gga ggt gaa gat ggc aag aat ggg      724
Asn Ile Asp Val Leu Asn Ser Phe Gly Gly Glu Asp Gly Lys Asn Gly
    220                 225                 230

aat gag aat gtg gag gag atg gag agt agt aga ggt agt ggt aca aag      772
Asn Glu Asn Val Glu Glu Met Glu Ser Ser Arg Gly Ser Gly Thr Lys
235                 240                 245                 250

aag acg aat ggt gga agt agt agt gat tct gaa gga gat agc agt gcg      820
Lys Thr Asn Gly Gly Ser Ser Ser Asp Ser Glu Gly Asp Ser Ser Ala
                255                 260                 265

agt ggg aat gtg aag gtt gcg ttg agt tct tct tct tca ggc gtg aag      868
Ser Gly Asn Val Lys Val Ala Leu Ser Ser Ser Ser Ser Gly Val Lys
            270                 275                 280

aga aga gca ggt gga gat att gct cct act ggt aga cat tac agg agt      916
Arg Arg Ala Gly Gly Asp Ile Ala Pro Thr Gly Arg His Tyr Arg Ser
        285                 290                 295

gtt tct atg gac agt tgt ttc atg ggg aag ttg aat ttc ggc gac gaa      964
Val Ser Met Asp Ser Cys Phe Met Gly Lys Leu Asn Phe Gly Asp Glu
    300                 305                 310
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tca tcg cta aag ctt ccg cct tct tca tca gct aaa gtt tcc cca acc     1012
Ser Ser Leu Lys Leu Pro Pro Ser Ser Ser Ala Lys Val Ser Pro Thr
315                 320                 325                 330

aat tca ggt gaa ggg aat tca agt gct tat agt gtt gaa ttt gga aac     1060
Asn Ser Gly Glu Gly Asn Ser Ser Ala Tyr Ser Val Glu Phe Gly Asn
                335                 340                 345

agt gag ttt act gca gct gaa atg aag aag att gca gct gat gag aaa     1108
Ser Glu Phe Thr Ala Ala Glu Met Lys Lys Ile Ala Ala Asp Glu Lys
            350                 355                 360

ctc gct gag att gta atg gct gac cct aag cgt gtt aaa aga atc ttg     1156
Leu Ala Glu Ile Val Met Ala Asp Pro Lys Arg Val Lys Arg Ile Leu
        365                 370                 375

gcg aac cgc gta tct gct gca cgt tca aag gag cgg aag acg cga tac     1204
Ala Asn Arg Val Ser Ala Ala Arg Ser Lys Glu Arg Lys Thr Arg Tyr
    380                 385                 390

atg gca gag ttg gaa cac aag gtg cag aca ctt cag act gaa gct act     1252
Met Ala Glu Leu Glu His Lys Val Gln Thr Leu Gln Thr Glu Ala Thr
395                 400                 405                 410

aca tta tcg gct cag ctc aca cat ttg cag aga gat tct atg ggg ttg     1300
Thr Leu Ser Ala Gln Leu Thr His Leu Gln Arg Asp Ser Met Gly Leu
                415                 420                 425

aca aac cag aac agt gag ctg aag ttt cgt ctt caa gct atg gag cag     1348
Thr Asn Gln Asn Ser Glu Leu Lys Phe Arg Leu Gln Ala Met Glu Gln
            430                 435                 440

caa gca caa ctc cgc gat gct ctg tca gag aaa ctg aat gaa gaa gtc     1396
Gln Ala Gln Leu Arg Asp Ala Leu Ser Glu Lys Leu Asn Glu Glu Val
        445                 450                 455

cag cgg ttg aaa ctg gtg ata ggg gag ccg aac cgc agg caa agt ggg     1444
Gln Arg Leu Lys Leu Val Ile Gly Glu Pro Asn Arg Arg Gln Ser Gly
    460                 465                 470

agc agc agc agc gaa tca aag atg tca cta aac ccg gag atg ttt cag     1492
Ser Ser Ser Ser Glu Ser Lys Met Ser Leu Asn Pro Glu Met Phe Gln
475                 480                 485                 490

cag ctt agc ata agt cag tta caa cac caa cag atg cag cat tcc aat     1540
Gln Leu Ser Ile Ser Gln Leu Gln His Gln Gln Met Gln His Ser Asn
                495                 500                 505

cag tgt agc aca atg aaa gca aag cac act tca aac gac tag             1582
Gln Cys Ser Thr Met Lys Ala Lys His Thr Ser Asn Asp
            510                 515

ggtaagtaaa actgcgatcc gcagttgtct agttacatat atgataagaa tcttttgtgc   1642

agagttctgt ttttggaagt tttaaagaaa catatataaa gattatgtcc gggaaatttg   1702

atcatatttc ctgaaacata cacacatata tatagtggta atggaggact ttctttctgg   1762
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acca 1766

<210> 164 <211> 519 <212> PRT <213> Arabidopsis thaliana <400> 164

Met Gly Gly Gly Gly Asp Thr Thr Asp Thr Asn Met Met Gln Arg Val
1 5 10 15

Asn Ser Ser Ser Gly Thr Ser Ser Ser Ser Ile Pro Lys His Asn Leu
20 25 30

His Leu Asn Pro Ala Leu Ile Arg Ser His His His Phe Arg His Pro
35 40 45

Phe Thr Gly Ala Pro Pro Pro Pro Ile Pro Pro Ile Ser Pro Tyr Ser
50 55 60

Gln Ile Pro Ala Thr Leu Gln Pro Arg His Ser Arg Ser Met Ser Gln
65 70 75 80

Pro Ser Ser Phe Phe Ser Phe Asp Ser Leu Pro Pro Leu Asn Pro Ser
85 90 95

Ala Pro Ser Val Ser Val Ser Val Glu Glu Lys Thr Gly Ala Gly Phe
100 105 110

Ser Pro Ser Leu Pro Pro Ser Pro Phe Thr Met Cys His Ser Ser Ser
115 120 125

Ser Arg Asn Ala Gly Asp Gly Glu Asn Leu Pro Pro Arg Lys Ser His
130 135 140

Arg Arg Ser Asn Ser Asp Val Thr Phe Gly Phe Ser Ser Met Met Ser
145 150 155 160

Gln Asn Gln Lys Ser Pro Pro Leu Ser Ser Leu Glu Arg Ser Ile Ser
165 170 175

Gly Glu Asp Thr Ser Asp Trp Ser Asn Leu Val Lys Lys Glu Pro Arg
180 185 190

Glu Gly Phe Tyr Lys Gly Arg Lys Pro Glu Val Glu Ala Ala Met Asp
195 200 205

Asp Val Phe Thr Ala Tyr Met Asn Leu Asp Asn Ile Asp Val Leu Asn
210 215 220

Ser Phe Gly Gly Glu Asp Gly Lys Asn Gly Asn Glu Asn Val Glu Glu
225 230 235 240

Met Glu Ser Ser Arg Gly Ser Gly Thr Lys Lys Thr Asn Gly Gly Ser
245 250 255

Ser Ser Asp Ser Glu Gly Asp Ser Ser Ala Ser Gly Asn Val Lys Val
260 265 270

Ala Leu Ser Ser Ser Ser Ser Gly Val Lys Arg Arg Ala Gly Gly Asp
275 280 285

Ile Ala Pro Thr Gly Arg His Tyr Arg Ser Val Ser Met Asp Ser Cys
290 295 300

Phe Met Gly Lys Leu Asn Phe Gly Asp Glu Ser Ser Leu Lys Leu Pro
305 310 315 320

Pro Ser Ser Ser Ala Lys Val Ser Pro Thr Asn Ser Gly Glu Gly Asn
325 330 335

Ser Ser Ala Tyr Ser Val Glu Phe Gly Asn Ser Glu Phe Thr Ala Ala
340 345 350

Glu Met Lys Lys Ile Ala Ala Asp Glu Lys Leu Ala Glu Ile Val Met
355 360 365

Ala Asp Pro Lys Arg Val Lys Arg Ile Leu Ala Asn Arg Val Ser Ala
370 375 380

Ala Arg Ser Lys Glu Arg Lys Thr Arg Tyr Met Ala Glu Leu Glu His
385 390 395 400

Lys Val Gln Thr Leu Gln Thr Glu Ala Thr Thr Leu Ser Ala Gln Leu
405 410 415

Thr His Leu Gln Arg Asp Ser Met Gly Leu Thr Asn Gln Asn Ser Glu
420 425 430

```
Leu Lys Phe Arg Leu Gln Ala Met Glu Gln Gln Ala Gln Leu Arg Asp
        435                 440                 445

Ala Leu Ser Glu Lys Leu Asn Glu Glu Val Gln Arg Leu Lys Leu Val
    450                 455                 460

Ile Gly Glu Pro Asn Arg Arg Gln Ser Gly Ser Ser Ser Ser Glu Ser
465                 470                 475                 480

Lys Met Ser Leu Asn Pro Glu Met Phe Gln Gln Leu Ser Ile Ser Gln
                485                 490                 495

Leu Gln His Gln Gln Met Gln His Ser Asn Gln Cys Ser Thr Met Lys
            500                 505                 510

Ala Lys His Thr Ser Asn Asp
        515
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09/03/2004 00:00:04

<210> 165 <211> 1304 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (138)..(1127) <223> G1052

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tcaaatcttt gatcctttcc tttgtttttc atttgacctc ttacaaaaaa atctggtgtg    120

ccattaaatc tttatta atg gca caa ctt cct ccg aaa atc cca acc atg        170
                  Met Ala Gln Leu Pro Pro Lys Ile Pro Thr Met
                  1               5                   10

acg acg cca aat tgg cct gac ttc tcc tcc cag aaa ctc cct tcc ata      218
Thr Thr Pro Asn Trp Pro Asp Phe Ser Ser Gln Lys Leu Pro Ser Ile
            15                  20                  25

gcc gca acg gcg gca gcc gca gca acc gct gga cct caa caa caa aac      266
Ala Ala Thr Ala Ala Ala Ala Ala Thr Ala Gly Pro Gln Gln Gln Asn
        30                  35                  40

cct tca tgg atg gat gag ttt ctc gac ttc tca gcg act cgc cgt ggg      314
Pro Ser Trp Met Asp Glu Phe Leu Asp Phe Ser Ala Thr Arg Arg Gly
    45                  50                  55

act cac cgt cgt tct ata agc gac tcc att gct ttc ctt gaa cca cct      362
Thr His Arg Arg Ser Ile Ser Asp Ser Ile Ala Phe Leu Glu Pro Pro
60                  65                  70                  75

tcc tcc ggc gtc gga aac cac cac ttc gat agg ttt gac gac gag caa      410
Ser Ser Gly Val Gly Asn His His Phe Asp Arg Phe Asp Asp Glu Gln
                80                  85                  90

ttc atg tcc atg ttc aac gac gac gta cac aac aat aac cac aat cat      458
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Phe Met Ser Met Phe Asn Asp Asp Val His Asn Asn Asn His Asn His
            95                  100                 105

cat cat cat cac agc atc aac ggc aat gtg ggt ccc acg cgt tca tcc      506
His His His His Ser Ile Asn Gly Asn Val Gly Pro Thr Arg Ser Ser
        110                 115                 120

tcc aac acc tcc acg ccg tcc gat cat aat agc ctt agc gac gac gac      554
Ser Asn Thr Ser Thr Pro Ser Asp His Asn Ser Leu Ser Asp Asp Asp
    125                 130                 135

aac aac aaa gaa gca cca ccg tcc gat cat gat cat cac atg gac aat      602
Asn Asn Lys Glu Ala Pro Pro Ser Asp His Asp His His Met Asp Asn
140                 145                 150                 155

aat gta gcc aat caa aac aac gcc gcc ggt aac aat tac aac gaa tca      650
Asn Val Ala Asn Gln Asn Asn Ala Ala Gly Asn Asn Tyr Asn Glu Ser
                160                 165                 170

gac gag gtc caa agc cag tgc aag acg gag cca caa gat ggt ccg tcg      698
Asp Glu Val Gln Ser Gln Cys Lys Thr Glu Pro Gln Asp Gly Pro Ser
            175                 180                 185

gcg aat caa aac tcc ggt gga agc tcc ggt aat cgt att cac gac cct      746
Ala Asn Gln Asn Ser Gly Gly Ser Ser Gly Asn Arg Ile His Asp Pro
        190                 195                 200

aaa agg gta aaa aga att tta gca aat agg caa tca gca cag aga tca      794
Lys Arg Val Lys Arg Ile Leu Ala Asn Arg Gln Ser Ala Gln Arg Ser
    205                 210                 215

agg gtg agg aaa ttg caa tac ata tca gag ctt gaa agg agc gtt act      842
Arg Val Arg Lys Leu Gln Tyr Ile Ser Glu Leu Glu Arg Ser Val Thr
220                 225                 230                 235

tca ttg cag act gaa gtg tca gtg tta tcg cca aga gtt gcg ttt ttg      890
Ser Leu Gln Thr Glu Val Ser Val Leu Ser Pro Arg Val Ala Phe Leu
                240                 245                 250

gat cat cag cga ttg ctt ctc aac gtc gac aat agt gct atc aag caa      938
Asp His Gln Arg Leu Leu Leu Asn Val Asp Asn Ser Ala Ile Lys Gln
            255                 260                 265

cga atc gca gct tta gca caa gat aag att ttc aaa gac gct cat caa      986
Arg Ile Ala Ala Leu Ala Gln Asp Lys Ile Phe Lys Asp Ala His Gln
        270                 275                 280

gaa gca ttg aag aga gaa ata gag aga ctt cga caa gta tat cat caa     1034
Glu Ala Leu Lys Arg Glu Ile Glu Arg Leu Arg Gln Val Tyr His Gln
    285                 290                 295

caa agc ctc aag aag atg gag aat aat gtc tcc gat caa tct ccg gcc     1082
Gln Ser Leu Lys Lys Met Glu Asn Asn Val Ser Asp Gln Ser Pro Ala
300                 305                 310                 315

gat atc aaa ccg tcc gtt gag aag gaa cag ctc ctc aat gtc taa         1127
Asp Ile Lys Pro Ser Val Glu Lys Glu Gln Leu Leu Asn Val
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320 325

agctgttcgt tcactaagat ctttcttttc atggcgaaaa gattcttgac tataaaacct 1187

ctttgtgtca agaaattaat ttatcaaaga agatggcctt ttttatttga tctaatcaca 1247

ttttttttaag ttgtgatgaa tttgcttttg atgtatctgt ttttttttttt ttttttt 1304

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Met Ala Gln Leu Pro Pro Lys Ile Pro Thr Met Thr Thr Pro Asn Trp
1 5 10 15

Pro Asp Phe Ser Ser Gln Lys Leu Pro Ser Ile Ala Ala Thr Ala Ala
20 25 30

Ala Ala Ala Thr Ala Gly Pro Gln Gln Gln Asn Pro Ser Trp Met Asp
35 40 45

Glu Phe Leu Asp Phe Ser Ala Thr Arg Arg Gly Thr His Arg Arg Ser
50 55 60

Ile Ser Asp Ser Ile Ala Phe Leu Glu Pro Pro Ser Ser Gly Val Gly
65 70 75 80

Asn His His Phe Asp Arg Phe Asp Asp Glu Gln Phe Met Ser Met Phe
85 90 95

Asn Asp Asp Val His Asn Asn Asn His Asn His His His His His Ser
100 105 110

Ile Asn Gly Asn Val Gly Pro Thr Arg Ser Ser Ser Asn Thr Ser Thr
115 120 125

Pro Ser Asp His Asn Ser Leu Ser Asp Asp Asp Asn Asn Lys Glu Ala
130 135 140

Pro Pro Ser Asp His Asp His His Met Asp Asn Asn Val Ala Asn Gln
145 150 155 160

Asn Asn Ala Ala Gly Asn Asn Tyr Asn Glu Ser Asp Glu Val Gln Ser
165 170 175

Gln Cys Lys Thr Glu Pro Gln Asp Gly Pro Ser Ala Asn Gln Asn Ser
180 185 190

Gly Gly Ser Ser Gly Asn Arg Ile His Asp Pro Lys Arg Val Lys Arg
195 200 205

Ile Leu Ala Asn Arg Gln Ser Ala Gln Arg Ser Arg Val Arg Lys Leu
210 215 220

Gln Tyr Ile Ser Glu Leu Glu Arg Ser Val Thr Ser Leu Gln Thr Glu
225 230 235 240

Val Ser Val Leu Ser Pro Arg Val Ala Phe Leu Asp His Gln Arg Leu
245 250 255

Leu Leu Asn Val Asp Asn Ser Ala Ile Lys Gln Arg Ile Ala Ala Leu
260 265 270

Ala Gln Asp Lys Ile Phe Lys Asp Ala His Gln Glu Ala Leu Lys Arg
275 280 285

Glu Ile Glu Arg Leu Arg Gln Val Tyr His Gln Gln Ser Leu Lys Lys
290 295 300

Met Glu Asn Asn Val Ser Asp Gln Ser Pro Ala Asp Ile Lys Pro Ser
305 310 315 320

Val Glu Lys Glu Gln Leu Leu Asn Val
325

<210> 167 <211> 1148 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (241)..(966) <223> G1063

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ctattgcttg agttctgatt gggcacagta gtaccattgc catttctctc acacataccg 120

tctctttctc tcatcatcaa tcatcaatca tccaaaagaa aaaaccctaa aatttcactt 180

gtaagctttt caccagtttc tctccatacc cattttatca gcttctccat atctttctct 240

atg gat tct gac ata atg aac atg atg atg cat cag atg gag aag ctt 288
Met Asp Ser Asp Ile Met Asn Met Met Met His Gln Met Glu Lys Leu
1 5 10 15

cct gag ttt tgt aac cct aat tcc tct ttc ttc tct ccc gac cac aac 336
Pro Glu Phe Cys Asn Pro Asn Ser Ser Phe Phe Ser Pro Asp His Asn
20 25 30

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aac act tac cct ttt ctc ttt aac tcc act cat tac cag tcc gat cac      384
Asn Thr Tyr Pro Phe Leu Phe Asn Ser Thr His Tyr Gln Ser Asp His
        35                  40                  45

tca atg acc aac gaa cca ggt ttc cgc tac ggt tcc ggt tta ctc act      432
Ser Met Thr Asn Glu Pro Gly Phe Arg Tyr Gly Ser Gly Leu Leu Thr
    50                  55                  60

aac cct tct tct atc tct ccc aac aca gct tac tct tcc gtt ttt ctt      480
Asn Pro Ser Ser Ile Ser Pro Asn Thr Ala Tyr Ser Ser Val Phe Leu
65                  70                  75                  80

gac aaa aga aac aac agt aac aac aac aat aat ggc acg aac atg gca      528
Asp Lys Arg Asn Asn Ser Asn Asn Asn Asn Asn Gly Thr Asn Met Ala
                85                  90                  95

gct atg cga gag atg atc ttc cgt atc gcc gtg atg caa ccg atc cat      576
Ala Met Arg Glu Met Ile Phe Arg Ile Ala Val Met Gln Pro Ile His
            100                 105                 110

atc gat ccc gag gcg gtt aag cca ccg aag agg agg aac gtc agg atc      624
Ile Asp Pro Glu Ala Val Lys Pro Pro Lys Arg Arg Asn Val Arg Ile
        115                 120                 125

tct aaa gat cct caa agc gtg gcg gct agg cat aga agg gag aga ata      672
Ser Lys Asp Pro Gln Ser Val Ala Ala Arg His Arg Arg Glu Arg Ile
    130                 135                 140

agc gag agg att cgg att ttg caa cgg ctt gtt cct ggt ggg acg aag      720
Ser Glu Arg Ile Arg Ile Leu Gln Arg Leu Val Pro Gly Gly Thr Lys
145                 150                 155                 160

atg gat aca gct tcg atg ctc gat gaa gca att cat tat gtg aag ttt      768
Met Asp Thr Ala Ser Met Leu Asp Glu Ala Ile His Tyr Val Lys Phe
                165                 170                 175

tta aag aaa cag gtg cag tct ctg gag gag cag gcg gtg gtt act ggc      816
Leu Lys Lys Gln Val Gln Ser Leu Glu Glu Gln Ala Val Val Thr Gly
            180                 185                 190

gga ggg gga gga gga gga gga agg gtt ttg atc ggt gga ggt gga atg      864
Gly Gly Gly Gly Gly Gly Gly Arg Val Leu Ile Gly Gly Gly Gly Met
        195                 200                 205

acg gcg gcg agt ggt ggt ggt ggc ggc ggg gga gtg gtt atg aaa ggg      912
Thr Ala Ala Ser Gly Gly Gly Gly Gly Gly Gly Val Val Met Lys Gly
    210                 215                 220

tgt gga aca gtg ggg act cat cag atg gtg ggc aat gca cag att ctt      960
Cys Gly Thr Val Gly Thr His Gln Met Val Gly Asn Ala Gln Ile Leu
225                 230                 235                 240

aga tga tgatgatttt taatttttatt attattatat taatgttgga gaaaaagaga     1016
Arg
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aaaatgattc tggagaggga agccaagtaa tttatgtgag agtctttaat ttaactttat 1076

tttcttgttt agataatgtg taatgatggt ttttaaagcc aaagactctc catggttgtt 1136

ggagcgagtt tg 1148

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Met Asp Ser Asp Ile Met Asn Met Met Met His Gln Met Glu Lys Leu
1 5 10 15

Pro Glu Phe Cys Asn Pro Asn Ser Ser Phe Phe Ser Pro Asp His Asn
20 25 30

Asn Thr Tyr Pro Phe Leu Phe Asn Ser Thr His Tyr Gln Ser Asp His
35 40 45

Ser Met Thr Asn Glu Pro Gly Phe Arg Tyr Gly Ser Gly Leu Leu Thr
50 55 60

Asn Pro Ser Ser Ile Ser Pro Asn Thr Ala Tyr Ser Ser Val Phe Leu
65 70 75 80

Asp Lys Arg Asn Asn Ser Asn Asn Asn Asn Asn Gly Thr Asn Met Ala
85 90 95

Ala Met Arg Glu Met Ile Phe Arg Ile Ala Val Met Gln Pro Ile His
100 105 110

Ile Asp Pro Glu Ala Val Lys Pro Pro Lys Arg Arg Asn Val Arg Ile
115 120 125

Ser Lys Asp Pro Gln Ser Val Ala Ala Arg His Arg Arg Glu Arg Ile
130 135 140

Ser Glu Arg Ile Arg Ile Leu Gln Arg Leu Val Pro Gly Gly Thr Lys
145 150 155 160

Met Asp Thr Ala Ser Met Leu Asp Glu Ala Ile His Tyr Val Lys Phe
165 170 175

Leu Lys Lys Gln Val Gln Ser Leu Glu Glu Gln Ala Val Val Thr Gly
180 185 190

```
Gly Gly Gly Gly Gly Gly Gly Arg Val Leu Ile Gly Gly Gly Gly Met
        195                 200                 205

Thr Ala Ala Ser Gly Gly Gly Gly Gly Gly Gly Val Val Met Lys Gly
    210                 215                 220

Cys Gly Thr Val Gly Thr His Gln Met Val Gly Asn Ala Gln Ile Leu
225                 230                 235                 240

Arg
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<222> (106)..(1575) <223> G1064

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ctttattttt tttcccctct tgtcgaaaac atcacatata aataaaaaac caaaaaccct      60

aatttataaa atatatataa aatagttata gctccccact tatat atg caa aag cca     117
                                                    Met Gln Lys Pro
                                                    1

aca tca agt atc tta aat gtc ata atg gac ggt gga gac agc gtc gga       165
Thr Ser Ser Ile Leu Asn Val Ile Met Asp Gly Gly Asp Ser Val Gly
5                   10                  15                  20

gga gga gga gga gat gat cac cac cgt cac ctc cac cat cac cac cgc       213
Gly Gly Gly Gly Asp Asp His His Arg His Leu His His His His Arg
                25                  30                  35

cct act ttc cct ttt caa cta ctc gga aaa cac gac ccc gac gac aac       261
Pro Thr Phe Pro Phe Gln Leu Leu Gly Lys His Asp Pro Asp Asp Asn
            40                  45                  50

cat caa caa caa cct tcc cct tcc tcc tcc tcc tct cta ttt tct ctc       309
His Gln Gln Gln Pro Ser Pro Ser Ser Ser Ser Ser Leu Phe Ser Leu
        55                  60                  65

cat caa cac caa caa tta tct caa tcg caa cct caa tcg caa tcg caa       357
His Gln His Gln Gln Leu Ser Gln Ser Gln Pro Gln Ser Gln Ser Gln
    70                  75                  80

aag tca caa ccg cag aca acg caa aaa gag tta tta caa acg caa gag       405
Lys Ser Gln Pro Gln Thr Thr Gln Lys Glu Leu Leu Gln Thr Gln Glu
85                  90                  95                  100

gaa tct gcg gtg gtg gca gct aaa aag cca ccg ttg aaa cga gcg tcg       453
Glu Ser Ala Val Val Ala Ala Lys Lys Pro Pro Leu Lys Arg Ala Ser
                105                 110                 115

acg aaa gac cga cac acg aaa gta gac gga aga ggg agg aga ata agg       501
Thr Lys Asp Arg His Thr Lys Val Asp Gly Arg Gly Arg Arg Ile Arg
            120                 125                 130
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atg ccg gcg tta tgt gca gct agg gtt ttt cag cta acg cga gag cta      549
Met Pro Ala Leu Cys Ala Ala Arg Val Phe Gln Leu Thr Arg Glu Leu
        135                 140                 145

ggt cat aaa tcc gac ggt gag aca ata gag tgg ctt ctt caa caa gct      597
Gly His Lys Ser Asp Gly Glu Thr Ile Glu Trp Leu Leu Gln Gln Ala
    150                 155                 160

gaa cca tct gta atc gcc gcc acc gga acc gga aca atc ccg gcg aat      645
Glu Pro Ser Val Ile Ala Ala Thr Gly Thr Gly Thr Ile Pro Ala Asn
165                 170                 175                 180

ttc act tct tta aac atc tct ctc cgt tct tca ggc tct tcc atg tct      693
Phe Thr Ser Leu Asn Ile Ser Leu Arg Ser Ser Gly Ser Ser Met Ser
                185                 190                 195

ctt cct tct cat ttc cgc tcc gcc gct tcc act ttt agc cct aat aac      741
Leu Pro Ser His Phe Arg Ser Ala Ala Ser Thr Phe Ser Pro Asn Asn
            200                 205                 210

ata ttt tct ccg gcg atg ctt caa caa caa caa caa caa caa cgt ggt      789
Ile Phe Ser Pro Ala Met Leu Gln Gln Gln Gln Gln Gln Gln Arg Gly
        215                 220                 225

ggt ggt gtt ggg ttt cat cat ccc cat cta cag gga cgt gca cct acg      837
Gly Gly Val Gly Phe His His Pro His Leu Gln Gly Arg Ala Pro Thr
    230                 235                 240

tcg tct ttg ttt cct ggt att gat aac ttc aca cca acg acg tcg ttt      885
Ser Ser Leu Phe Pro Gly Ile Asp Asn Phe Thr Pro Thr Thr Ser Phe
245                 250                 255                 260

ttg aac ttt cat aat cca aca aag caa gaa gga gat caa gat tct gaa      933
Leu Asn Phe His Asn Pro Thr Lys Gln Glu Gly Asp Gln Asp Ser Glu
                265                 270                 275

gag tta aac tcg gag aag aaa aga aga atc caa acg acg tcg gat ttg      981
Glu Leu Asn Ser Glu Lys Lys Arg Arg Ile Gln Thr Thr Ser Asp Leu
            280                 285                 290

cat caa caa caa caa caa cac caa cat gat caa atc gga gga tat aca     1029
His Gln Gln Gln Gln Gln His Gln His Asp Gln Ile Gly Gly Tyr Thr
        295                 300                 305

ctt caa tct agc aac agt gga tct acg gcc acc gca gcc gcc gcg caa     1077
Leu Gln Ser Ser Asn Ser Gly Ser Thr Ala Thr Ala Ala Ala Ala Gln
    310                 315                 320

caa ata ccg gga aat ttc tgg atg gtt gcg gcg gct gcg gct gca ggt     1125
Gln Ile Pro Gly Asn Phe Trp Met Val Ala Ala Ala Ala Ala Ala Gly
325                 330                 335                 340

ggt ggt ggt ggt aat aac aac caa aca ggt ggt ctt atg aca gct tct     1173
Gly Gly Gly Gly Asn Asn Asn Gln Thr Gly Gly Leu Met Thr Ala Ser
                345                 350                 355
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att ggt act ggt ggc ggc ggt gga gag cct gtt tgg acg ttt cct tcc 1221
Ile Gly Thr Gly Gly Gly Gly Gly Glu Pro Val Trp Thr Phe Pro Ser
360 365 370

att aac acg gca gcg gca gcg tta tat aga agt ggc gtt tcg ggc gtt 1269
Ile Asn Thr Ala Ala Ala Ala Leu Tyr Arg Ser Gly Val Ser Gly Val
375 380 385

cca agc ggc gcg gtt tct agc ggt tta cat ttt atg aat ttc gca gcg 1317
Pro Ser Gly Ala Val Ser Ser Gly Leu His Phe Met Asn Phe Ala Ala
390 395 400

cca atg gca ttt ctt act gga caa caa cag cta gca aca act agt aat 1365
Pro Met Ala Phe Leu Thr Gly Gln Gln Gln Leu Ala Thr Thr Ser Asn
405 410 415 420

cat gag att aat gaa gat agt aat aat aat gaa gga gga aga agt gac 1413
His Glu Ile Asn Glu Asp Ser Asn Asn Asn Glu Gly Gly Arg Ser Asp
425 430 435

ggt ggt ggt gat cat cat aat aca cag aga cat cat cat cat caa caa 1461
Gly Gly Gly Asp His His Asn Thr Gln Arg His His His His Gln Gln
440 445 450

caa cat cat cat aat att ctc tcc ggc ttg aac cag tac gga cgg caa 1509
Gln His His His Asn Ile Leu Ser Gly Leu Asn Gln Tyr Gly Arg Gln
455 460 465

gtt tcc ggc gac tct caa gct agt gga tca ctt gga ggt ggt gat gag 1557
Val Ser Gly Asp Ser Gln Ala Ser Gly Ser Leu Gly Gly Gly Asp Glu
470 475 480

gag gat cag caa gat tag acacacacaa aaacatttta atggtgggat 1605
Glu Asp Gln Gln Asp
485

tttctgccga cggcggtagc ggtgacggcg ttcggcggct gtgtaaaact tttgttttca 1665

ccgttaattt tttttatttt ctgtagtaat ttttttttgct aagtaaaaaa aaaaaaaaaa 1725

aaa 1728

<210> 170 <211> 489 <212> PRT <213> Arabidopsis thaliana <400> 170

Met Gln Lys Pro Thr Ser Ser Ile Leu Asn Val Ile Met Asp Gly Gly
1 5 10 15

Asp Ser Val Gly Gly Gly Gly Gly Asp Asp His His Arg His Leu His
20 25 30

His His His Arg Pro Thr Phe Pro Phe Gln Leu Leu Gly Lys His Asp
35 40 45

Pro Asp Asp Asn His Gln Gln Gln Pro Ser Pro Ser Ser Ser Ser Ser
50 55 60

Leu Phe Ser Leu His Gln His Gln Gln Leu Ser Gln Ser Gln Pro Gln
65 70 75 80

Ser Gln Ser Gln Lys Ser Gln Pro Gln Thr Thr Gln Lys Glu Leu Leu
85 90 95

Gln Thr Gln Glu Glu Ser Ala Val Val Ala Ala Lys Lys Pro Pro Leu
100 105 110

Lys Arg Ala Ser Thr Lys Asp Arg His Thr Lys Val Asp Gly Arg Gly
115 120 125

Arg Arg Ile Arg Met Pro Ala Leu Cys Ala Ala Arg Val Phe Gln Leu
130 135 140

Thr Arg Glu Leu Gly His Lys Ser Asp Gly Glu Thr Ile Glu Trp Leu
145 150 155 160

Leu Gln Gln Ala Glu Pro Ser Val Ile Ala Ala Thr Gly Thr Gly Thr
165 170 175

Ile Pro Ala Asn Phe Thr Ser Leu Asn Ile Ser Leu Arg Ser Ser Gly
180 185 190

Ser Ser Met Ser Leu Pro Ser His Phe Arg Ser Ala Ala Ser Thr Phe
195 200 205

Ser Pro Asn Asn Ile Phe Ser Pro Ala Met Leu Gln Gln Gln Gln Gln
210 215 220

Gln Gln Arg Gly Gly Gly Val Gly Phe His His Pro His Leu Gln Gly
225 230 235 240

Arg Ala Pro Thr Ser Ser Leu Phe Pro Gly Ile Asp Asn Phe Thr Pro
245 250 255

Thr Thr Ser Phe Leu Asn Phe His Asn Pro Thr Lys Gln Glu Gly Asp
260 265 270

Gln Asp Ser Glu Glu Leu Asn Ser Glu Lys Lys Arg Arg Ile Gln Thr

275 280 285

Thr Ser Asp Leu His Gln Gln Gln Gln His Gln His Asp Gln Ile
290 295 300

Gly Gly Tyr Thr Leu Gln Ser Ser Asn Ser Gly Ser Thr Ala Thr Ala
305 310 315 320

Ala Ala Ala Gln Gln Ile Pro Gly Asn Phe Trp Met Val Ala Ala Ala
325 330 335

Ala Ala Ala Gly Gly Gly Gly Gly Asn Asn Asn Gln Thr Gly Gly Leu
340 345 350

Met Thr Ala Ser Ile Gly Thr Gly Gly Gly Gly Gly Glu Pro Val Trp
355 360 365

Thr Phe Pro Ser Ile Asn Thr Ala Ala Ala Ala Leu Tyr Arg Ser Gly
370 375 380

Val Ser Gly Val Pro Ser Gly Ala Val Ser Ser Gly Leu His Phe Met
385 390 395 400

Asn Phe Ala Ala Pro Met Ala Phe Leu Thr Gly Gln Gln Gln Leu Ala
405 410 415

Thr Thr Ser Asn His Glu Ile Asn Glu Asp Ser Asn Asn Asn Glu Gly
420 425 430

Gly Arg Ser Asp Gly Gly Gly Asp His His Asn Thr Gln Arg His His
435 440 445

His His Gln Gln Gln His His His Asn Ile Leu Ser Gly Leu Asn Gln
450 455 460

Tyr Gly Arg Gln Val Ser Gly Asp Ser Gln Ala Ser Gly Ser Leu Gly
465 470 475 480

Gly Gly Asp Glu Glu Asp Gln Gln Asp
485

<210> 171 <211> 1473 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (436)..(1371) <223> G1067

<400> 171
tctcaagctt ctctctcctt tttttcccat agcacatcag aatcgctaaa tacgactcct 60

atgcaaagaa gaagctactt ctttctcttg ccctaattaa tctacctaac tagggtttcc 120

tcttaccttt catgagagag atcatttaac ataagtcacc ttttttatat cttttgcttc 180

gtctttaatt tagttctgtt cttggtctgt ttctatattt tgtcggcttg cgtaaccgat 240

cacaccttaa tgctttagct attgtttcct caaaatcatg agttttgact tctcgatctg 300

agttttcttt ttctctcttt acgctcttct tcacctagct accaatatat gaacgagcag 360

gatcaagaat cgagaaattg atttgagctg gcgaataagc agtggtggga tagggaatta 420

gtagatgcgg cggcg atg gaa ggc ggt tac gag caa ggc ggt gga gct tct 471
Met Glu Gly Gly Tyr Glu Gln Gly Gly Gly Ala Ser
1 5 10

aga tac ttc cat aac ctc ttt aga ccg gag att cac cac caa cag ctt 519
Arg Tyr Phe His Asn Leu Phe Arg Pro Glu Ile His His Gln Gln Leu
15 20 25

caa ccg cag ggc ggg atc aat ctt atc gac cag cat cat cat cag cac 567
Gln Pro Gln Gly Gly Ile Asn Leu Ile Asp Gln His His His Gln His
30 35 40

cag caa cat caa caa caa caa caa ccg tcg gat gat tca aga gaa tct 615
Gln Gln His Gln Gln Gln Gln Gln Pro Ser Asp Asp Ser Arg Glu Ser
45 50 55 60

gac cat tca aac aaa gat cat cat caa cag ggt cga ccc gat tca gac 663
Asp His Ser Asn Lys Asp His His Gln Gln Gly Arg Pro Asp Ser Asp
65 70 75

ccg aat aca tca agc tca gca ccg gga aaa cgt cca cgt gga cgt cca 711
Pro Asn Thr Ser Ser Ser Ala Pro Gly Lys Arg Pro Arg Gly Arg Pro
80 85 90

cca gga tct aag aac aaa gcc aag cca ccg atc ata gta act cgt gat 759
Pro Gly Ser Lys Asn Lys Ala Lys Pro Pro Ile Ile Val Thr Arg Asp
95 100 105

agc ccc aac gcg ctt aga tct cac gtt ctt gaa gta tct cct gga gct 807
Ser Pro Asn Ala Leu Arg Ser His Val Leu Glu Val Ser Pro Gly Ala
110 115 120

gac ata gtt gag agt gtt tcc acg tac gct agg agg aga ggg aga ggc 855
Asp Ile Val Glu Ser Val Ser Thr Tyr Ala Arg Arg Arg Gly Arg Gly
125 130 135 140

gtc tcc gtt tta gga gga aac ggc acc gta tct aac gtc act ctc cgt 903
Val Ser Val Leu Gly Gly Asn Gly Thr Val Ser Asn Val Thr Leu Arg
145 150 155

cag cca gtc act cct gga aat ggc ggt ggt gtg tcc gga gga gga gga 951

```
Gln Pro Val Thr Pro Gly Asn Gly Gly Gly Val Ser Gly Gly Gly Gly
            160                 165                 170

gtt gtg act tta cat gga agg ttt gag att ctt tcg cta acg ggg act      999
Val Val Thr Leu His Gly Arg Phe Glu Ile Leu Ser Leu Thr Gly Thr
        175                 180                 185

gtt ttg cca cct cct gca ccg cct ggt gcc ggt ggt ttg tct ata ttt     1047
Val Leu Pro Pro Pro Ala Pro Pro Gly Ala Gly Gly Leu Ser Ile Phe
    190                 195                 200

tta gcc gga ggg caa ggt cag gtg gtc gga gga agc gtt gtg gct ccc     1095
Leu Ala Gly Gly Gln Gly Gln Val Val Gly Gly Ser Val Val Ala Pro
205                 210                 215                 220

ctt att gca tca gct ccg gtt ata cta atg gcg gct tcg ttc tca aat     1143
Leu Ile Ala Ser Ala Pro Val Ile Leu Met Ala Ala Ser Phe Ser Asn
                225                 230                 235

gcg gtt ttc gag aga cta ccg att gag gag gag gaa gaa gaa ggt ggt     1191
Ala Val Phe Glu Arg Leu Pro Ile Glu Glu Glu Glu Glu Glu Gly Gly
            240                 245                 250

ggt ggc gga gga gga gga gga gga ggg cca ccg cag atg caa caa gct     1239
Gly Gly Gly Gly Gly Gly Gly Gly Gly Pro Pro Gln Met Gln Gln Ala
        255                 260                 265

cca tca gca tct ccg ccg tct gga gtg acc ggt cag gga cag tta gga     1287
Pro Ser Ala Ser Pro Pro Ser Gly Val Thr Gly Gln Gly Gln Leu Gly
    270                 275                 280

ggt aat gtg ggt ggt tat ggg ttt tct ggt gat cct cat ttg ctt gga     1335
Gly Asn Val Gly Gly Tyr Gly Phe Ser Gly Asp Pro His Leu Leu Gly
285                 290                 295                 300

tgg gga gct gga aca cct tca aga cca cct ttt taa ttgaatttta          1381
Trp Gly Ala Gly Thr Pro Ser Arg Pro Pro Phe
                305                 310

atgtccggaa atttatgtgt ttttatcatc ttgaggagtc gtctttcctt tgggatattt   1441

ggtgtttaat gtttagttga tatgcatatt tt                                 1473
```

<210> 172 <211> 311 <212> PRT <213> Arabidopsis thaliana <400> 172

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Met Glu Gly Gly Tyr Glu Gln Gly Gly Gly Ala Ser Arg Tyr Phe His
1               5                   10                  15

Asn Leu Phe Arg Pro Glu Ile His His Gln Gln Leu Gln Pro Gln Gly
            20                  25                  30

Gly Ile Asn Leu Ile Asp Gln His His His Gln His Gln Gln His Gln
        35                  40                  45
```

Gln Gln Gln Gln Pro Ser Asp Asp Ser Arg Glu Ser Asp His Ser Asn
50 55 60

Lys Asp His His Gln Gln Gly Arg Pro Asp Ser Asp Pro Asn Thr Ser
65 70 75 80

Ser Ser Ala Pro Gly Lys Arg Pro Arg Gly Arg Pro Pro Gly Ser Lys
85 90 95

Asn Lys Ala Lys Pro Pro Ile Ile Val Thr Arg Asp Ser Pro Asn Ala
100 105 110

Leu Arg Ser His Val Leu Glu Val Ser Pro Gly Ala Asp Ile Val Glu
115 120 125

Ser Val Ser Thr Tyr Ala Arg Arg Arg Gly Arg Gly Val Ser Val Leu
130 135 140

Gly Gly Asn Gly Thr Val Ser Asn Val Thr Leu Arg Gln Pro Val Thr
145 150 155 160

Pro Gly Asn Gly Gly Gly Val Ser Gly Gly Gly Gly Val Val Thr Leu
165 170 175

His Gly Arg Phe Glu Ile Leu Ser Leu Thr Gly Thr Val Leu Pro Pro
180 185 190

Pro Ala Pro Pro Gly Ala Gly Gly Leu Ser Ile Phe Leu Ala Gly Gly
195 200 205

Gln Gly Gln Val Val Gly Gly Ser Val Val Ala Pro Leu Ile Ala Ser
210 215 220

Ala Pro Val Ile Leu Met Ala Ala Ser Phe Ser Asn Ala Val Phe Glu
225 230 235 240

Arg Leu Pro Ile Glu Glu Glu Glu Glu Glu Gly Gly Gly Gly Gly Gly
245 250 255

Gly Gly Gly Gly Gly Pro Pro Gln Met Gln Gln Ala Pro Ser Ala Ser
260 265 270

```
Pro Pro Ser Gly Val Thr Gly Gln Gly Gln Leu Gly Gly Asn Val Gly
        275                 280                 285

Gly Tyr Gly Phe Ser Gly Asp Pro His Leu Leu Gly Trp Gly Ala Gly
    290                 295                 300

Thr Pro Ser Arg Pro Pro Phe
305                 310
```

<210> 173 <211> 1295 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (170)..(1144) <223> G1070

<400> 173

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tcgaccagct tggatttcgt tgttcatcat tactactctc tttcttcttc tagctagcta     60

gttttgacag caaaataaga agcaaaaaaa aggtcaacta aaaaagatct gttcttagat    120

cactctcttc ttctttttt gatccaattc caccattgaa tcatagatc atg gat cca     178
                                                    Met Asp Pro
                                                    1

gta caa tct cat gga tca caa agc tct cta cct cct cct ttc cac gca      226
Val Gln Ser His Gly Ser Gln Ser Ser Leu Pro Pro Pro Phe His Ala
    5                   10                  15

aga gac ttt caa tta cat ctt caa caa cag caa caa gag ttc ttc ctc      274
Arg Asp Phe Gln Leu His Leu Gln Gln Gln Gln Gln Glu Phe Phe Leu
20                  25                  30                  35

cac cat cac cag caa caa aga aac caa acc gat ggt gac caa caa gga      322
His His His Gln Gln Gln Arg Asn Gln Thr Asp Gly Asp Gln Gln Gly
                40                  45                  50

gga tca gga gga aac cga caa atc aag atg gat cgt gaa gag aca agc      370
Gly Ser Gly Gly Asn Arg Gln Ile Lys Met Asp Arg Glu Glu Thr Ser
            55                  60                  65

gac aac ata gac aac ata gct aac aac agc ggt agt gaa ggt aaa gac      418
Asp Asn Ile Asp Asn Ile Ala Asn Asn Ser Gly Ser Glu Gly Lys Asp
        70                  75                  80

ata gat ata cac ggt ggt tca gga gaa gga ggt ggt ggc tcc gga gga      466
Ile Asp Ile His Gly Gly Ser Gly Glu Gly Gly Gly Gly Ser Gly Gly
    85                  90                  95

gat cat cag atg aca aga aga cca aga gga aga cca gcg gga tcc aag      514
Asp His Gln Met Thr Arg Arg Pro Arg Gly Arg Pro Ala Gly Ser Lys
100                 105                 110                 115

aac aaa cca aaa cca ccg att atc atc aca cgg gac agc gca aac gcg      562
Asn Lys Pro Lys Pro Pro Ile Ile Ile Thr Arg Asp Ser Ala Asn Ala
                120                 125                 130

ctt aga acc cac gtg atg gag atc gga gat ggc tgc gac tta gtc gaa      610
```

```
Leu Arg Thr His Val Met Glu Ile Gly Asp Gly Cys Asp Leu Val Glu
            135                 140                 145

agc gtt gcc act ttt gca cga aga cgc caa cgc ggc gtt tgc gtt atg      658
Ser Val Ala Thr Phe Ala Arg Arg Arg Gln Arg Gly Val Cys Val Met
        150                 155                 160

agc ggt act gga aat gtt act aac gtc act ata cgt cag cct gga tct      706
Ser Gly Thr Gly Asn Val Thr Asn Val Thr Ile Arg Gln Pro Gly Ser
    165                 170                 175

cat cct tct cct ggc tcg gta gtt agt ctt cac gga agg ttc gag att      754
His Pro Ser Pro Gly Ser Val Val Ser Leu His Gly Arg Phe Glu Ile
180                 185                 190                 195

cta tct ctc tca gga tct ttt ctc cct cct ccg gct cct cct aca gcc      802
Leu Ser Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala Pro Pro Thr Ala
                200                 205                 210

acc gga ttg agt gtt tac ctc gct gga gga caa gga cag gtg gtt gga      850
Thr Gly Leu Ser Val Tyr Leu Ala Gly Gly Gln Gly Gln Val Val Gly
            215                 220                 225

gga agc gta gtt ggt ccg ttg tta tgt gct ggt cct gtc gtt gtc atg      898
Gly Ser Val Val Gly Pro Leu Leu Cys Ala Gly Pro Val Val Val Met
        230                 235                 240

gct gcg tct ttt agc aat gcg gcg tac gaa agg ttg cct tta gag gaa      946
Ala Ala Ser Phe Ser Asn Ala Ala Tyr Glu Arg Leu Pro Leu Glu Glu
    245                 250                 255

gat gag atg cag acg ccg gtt cat ggc gga gga gga gga gga tca ttg      994
Asp Glu Met Gln Thr Pro Val His Gly Gly Gly Gly Gly Gly Ser Leu
260                 265                 270                 275

gag tcg ccg cca atg atg gga caa caa ctg caa cat cag caa caa gct     1042
Glu Ser Pro Pro Met Met Gly Gln Gln Leu Gln His Gln Gln Gln Ala
                280                 285                 290

atg tca ggt cat caa ggg tta cca cct aat ctt ctt ggt tcg gtt cag     1090
Met Ser Gly His Gln Gly Leu Pro Pro Asn Leu Leu Gly Ser Val Gln
            295                 300                 305

ttg cag cag caa cat gat cag tct tat tgg tca acg gga cga cca ccg     1138
Leu Gln Gln Gln His Asp Gln Ser Tyr Trp Ser Thr Gly Arg Pro Pro
        310                 315                 320

tat tga tcaaatatac acacacactc ataatcgttg ctagctagct aacgatgaat     1194
Tyr

catgagttta gtggatatat atatgattaa aagaggttag cttatgaaca ttaataagag   1254

tttggattct atcgagcttc attatgtttg ggtcatcgtt c                       1295

<210>  174 <211>  324 <212>  PRT <213>  Arabidopsis thaliana  <400>  174
```

```
Met Asp Pro Val Gln Ser His Gly Ser Gln Ser Ser Leu Pro Pro Pro
1               5                   10                  15

Phe His Ala Arg Asp Phe Gln Leu His Leu Gln Gln Gln Gln Gln Glu
            20                  25                  30

Phe Phe Leu His His His Gln Gln Gln Arg Asn Gln Thr Asp Gly Asp
        35                  40                  45

Gln Gln Gly Gly Ser Gly Gly Asn Arg Gln Ile Lys Met Asp Arg Glu
    50                  55                  60

Glu Thr Ser Asp Asn Ile Asp Asn Ile Ala Asn Asn Ser Gly Ser Glu
65                  70                  75                  80

Gly Lys Asp Ile Asp Ile His Gly Gly Ser Gly Glu Gly Gly Gly Gly
                85                  90                  95

Ser Gly Gly Asp His Gln Met Thr Arg Arg Pro Arg Gly Arg Pro Ala
            100                 105                 110

Gly Ser Lys Asn Lys Pro Lys Pro Pro Ile Ile Ile Thr Arg Asp Ser
        115                 120                 125

Ala Asn Ala Leu Arg Thr His Val Met Glu Ile Gly Asp Gly Cys Asp
    130                 135                 140

Leu Val Glu Ser Val Ala Thr Phe Ala Arg Arg Arg Gln Arg Gly Val
145                 150                 155                 160

Cys Val Met Ser Gly Thr Gly Asn Val Thr Asn Val Thr Ile Arg Gln
                165                 170                 175

Pro Gly Ser His Pro Ser Pro Gly Ser Val Val Ser Leu His Gly Arg
            180                 185                 190

Phe Glu Ile Leu Ser Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala Pro
        195                 200                 205

Pro Thr Ala Thr Gly Leu Ser Val Tyr Leu Ala Gly Gly Gln Gly Gln
    210                 215                 220
```

```
Val Val Gly Gly Ser Val Val Gly Pro Leu Leu Cys Ala Gly Pro Val
225                 230                 235                 240

Val Val Met Ala Ala Ser Phe Ser Asn Ala Ala Tyr Glu Arg Leu Pro
                245                 250                 255

Leu Glu Glu Asp Glu Met Gln Thr Pro Val His Gly Gly Gly Gly Gly
            260                 265                 270

Gly Ser Leu Glu Ser Pro Pro Met Met Gly Gln Gln Leu Gln His Gln
        275                 280                 285

Gln Gln Ala Met Ser Gly His Gln Gly Leu Pro Pro Asn Leu Leu Gly
    290                 295                 300

Ser Val Gln Leu Gln Gln Gln His Asp Gln Ser Tyr Trp Ser Thr Gly
305                 310                 315                 320

Arg Pro Pro Tyr
```

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<210> 175 <211> 1084 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (19)..(876) <223> G1075

<400> 175

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tttgtgtttg gtgctggc atg gct ggt ctc gat cta ggc aca act tct cgc       51
                       Met Ala Gly Leu Asp Leu Gly Thr Thr Ser Arg
                       1               5                   10

tac gtc cac aac gtc gat ggt ggc ggc ggc gga cag ttc acc acc gac       99
Tyr Val His Asn Val Asp Gly Gly Gly Gly Gly Gln Phe Thr Thr Asp
            15                  20                  25

aac cac cac gaa gat gac ggt ggc gct gga gga aac cac cat cat cac      147
Asn His His Glu Asp Asp Gly Gly Ala Gly Gly Asn His His His His
        30                  35                  40

cat cat aat cat aat cac cat caa ggt tta gat tta ata gct tct aat      195
His His Asn His Asn His His Gln Gly Leu Asp Leu Ile Ala Ser Asn
    45                  50                  55

gat aac tct gga cta ggc ggc ggt gga gga gga ggg agc ggt gac ctc      243
Asp Asn Ser Gly Leu Gly Gly Gly Gly Gly Gly Gly Ser Gly Asp Leu
60                  65                  70                  75

gtc atg cgt cgg cca cgt ggc cgt cca gct gga tcg aag aac aaa ccg      291
Val Met Arg Arg Pro Arg Gly Arg Pro Ala Gly Ser Lys Asn Lys Pro
                80                  85                  90

aag ccg ccg gtg att gtc acg cgc gag agc gca aac act ctt agg gct      339
```

```
Lys Pro Pro Val Ile Val Thr Arg Glu Ser Ala Asn Thr Leu Arg Ala
            95                  100                 105

cac att ctt gaa gtt gga agt ggc tgc gac gtt ttc gaa tgt atc tcc      387
His Ile Leu Glu Val Gly Ser Gly Cys Asp Val Phe Glu Cys Ile Ser
        110                 115                 120

act tac gct cgt cgg aga cag cgc ggg att tgc gtt tta tcc ggg acg      435
Thr Tyr Ala Arg Arg Arg Gln Arg Gly Ile Cys Val Leu Ser Gly Thr
    125                 130                 135

gga acc gtc act aac gtc agc atc cgt cag cct acg gcg gcc gga gct      483
Gly Thr Val Thr Asn Val Ser Ile Arg Gln Pro Thr Ala Ala Gly Ala
140                 145                 150                 155

gtt gtg act ctg cgg ggt act ttt gag att ctt tcc ctc tcc gga tct      531
Val Val Thr Leu Arg Gly Thr Phe Glu Ile Leu Ser Leu Ser Gly Ser
                160                 165                 170

ttt ctt ccg cca cct gct cct cca ggg gcg act agc ttg acg ata ttc      579
Phe Leu Pro Pro Pro Ala Pro Pro Gly Ala Thr Ser Leu Thr Ile Phe
            175                 180                 185

ctc gct gga gct caa gga cag gtc gtc gga ggt aac gta gtt ggt gag      627
Leu Ala Gly Ala Gln Gly Gln Val Val Gly Gly Asn Val Val Gly Glu
        190                 195                 200

tta atg gcg gcg ggg ccg gta atg gtc atg gca gcg tct ttt aca aac      675
Leu Met Ala Ala Gly Pro Val Met Val Met Ala Ala Ser Phe Thr Asn
    205                 210                 215

gtg gct tac gaa agg ttg cct ttg gac gag cat gag gag cac ttg caa      723
Val Ala Tyr Glu Arg Leu Pro Leu Asp Glu His Glu Glu His Leu Gln
220                 225                 230                 235

agt ggc ggc ggc gga ggt gga ggg aat atg tac tcg gaa gcc act ggc      771
Ser Gly Gly Gly Gly Gly Gly Gly Asn Met Tyr Ser Glu Ala Thr Gly
                240                 245                 250

ggt ggc gga ggg ttg cct ttc ttt aat ttg ccg atg agt atg cct cag      819
Gly Gly Gly Gly Leu Pro Phe Phe Asn Leu Pro Met Ser Met Pro Gln
            255                 260                 265

att gga gtt gaa agt tgg cag ggg aat cac gcc ggc gcc ggt agg gct      867
Ile Gly Val Glu Ser Trp Gln Gly Asn His Ala Gly Ala Gly Arg Ala
        270                 275                 280

ccg ttt tag caatttaaga aactttaatt gtttttttcca ctttttttgtt            916
Pro Phe
    285

tttctccgaa ttttatgaaa ttatgattta agaaaaaaaa cgatattgtt catgtattga    976

ccctcttact gcatggtttc ttctattggg ttaattggct agctcataag aattgtttaa   1036

tttggttatt gtcatcaaat ttgcccacat ataaagcttc tagcaaat                1084
```

<210> 176 <211> 285 <212> PRT <213> Arabidopsis thaliana <400> 176

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Met Ala Gly Leu Asp Leu Gly Thr Thr Ser Arg Tyr Val His Asn Val
1               5                  10                  15

Asp Gly Gly Gly Gly Gly Gln Phe Thr Thr Asp Asn His His Glu Asp
            20                  25                  30

Asp Gly Gly Ala Gly Gly Asn His His His His His His Asn His Asn
        35                  40                  45

His His Gln Gly Leu Asp Leu Ile Ala Ser Asn Asp Asn Ser Gly Leu
    50                  55                  60

Gly Gly Gly Gly Gly Gly Gly Ser Gly Asp Leu Val Met Arg Arg Pro
65                  70                  75                  80

Arg Gly Arg Pro Ala Gly Ser Lys Asn Lys Pro Lys Pro Pro Val Ile
                85                  90                  95

Val Thr Arg Glu Ser Ala Asn Thr Leu Arg Ala His Ile Leu Glu Val
            100                 105                 110

Gly Ser Gly Cys Asp Val Phe Glu Cys Ile Ser Thr Tyr Ala Arg Arg
        115                 120                 125

Arg Gln Arg Gly Ile Cys Val Leu Ser Gly Thr Gly Thr Val Thr Asn
    130                 135                 140

Val Ser Ile Arg Gln Pro Thr Ala Ala Gly Ala Val Val Thr Leu Arg
145                 150                 155                 160

Gly Thr Phe Glu Ile Leu Ser Leu Ser Gly Ser Phe Leu Pro Pro Pro
                165                 170                 175

Ala Pro Pro Gly Ala Thr Ser Leu Thr Ile Phe Leu Ala Gly Ala Gln
            180                 185                 190

Gly Gln Val Val Gly Gly Asn Val Val Gly Glu Leu Met Ala Ala Gly
        195                 200                 205

Pro Val Met Val Met Ala Ala Ser Phe Thr Asn Val Ala Tyr Glu Arg
    210                 215                 220
```

```
Leu Pro Leu Asp Glu His Glu Glu His Leu Gln Ser Gly Gly Gly Gly
225                 230                 235                 240

Gly Gly Gly Asn Met Tyr Ser Glu Ala Thr Gly Gly Gly Gly Gly Leu
                245                 250                 255

Pro Phe Phe Asn Leu Pro Met Ser Met Pro Gln Ile Gly Val Glu Ser
            260                 265                 270

Trp Gln Gly Asn His Ala Gly Ala Gly Arg Ala Pro Phe
        275                 280                 285
```

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<210> 177 <211> 2663 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (31)..(2427) <223> G1089

<400> 177

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aagtaagaga gcttcttaag gaagaagaag atg ggt tgt gct caa tca aag atc      54
                                    Met Gly Cys Ala Gln Ser Lys Ile
                                    1               5

gag aac gaa gaa gca gtt act cgt tgc aaa gaa cga aaa caa ttg atg      102
Glu Asn Glu Glu Ala Val Thr Arg Cys Lys Glu Arg Lys Gln Leu Met
    10                  15                  20

aaa gac gcc gtc act gct cgt aac gct ttc gcc gcc gct cac tca gct      150
Lys Asp Ala Val Thr Ala Arg Asn Ala Phe Ala Ala Ala His Ser Ala
25                  30                  35                  40

tac gct atg gct ctt aaa aac acc gga gct gct ctt tcc gat tac tct      198
Tyr Ala Met Ala Leu Lys Asn Thr Gly Ala Ala Leu Ser Asp Tyr Ser
                45                  50                  55

cac ggc gag ttt tta gtc tct aat cac tcg tct tcc tcc gca gct gca      246
His Gly Glu Phe Leu Val Ser Asn His Ser Ser Ser Ser Ala Ala Ala
            60                  65                  70

gca atc gct tct act tct tct ctt ccc act gct ata tct cct cct ctt      294
Ala Ile Ala Ser Thr Ser Ser Leu Pro Thr Ala Ile Ser Pro Pro Leu
        75                  80                  85

cct tct tcc acc gct ccg gtt tct aat tca acc gct tct tct tcc tcc      342
Pro Ser Ser Thr Ala Pro Val Ser Asn Ser Thr Ala Ser Ser Ser Ser
    90                  95                  100

gct gcg gtt cct cag ccg att cct gat act ctt cct cct cct cct cct      390
Ala Ala Val Pro Gln Pro Ile Pro Asp Thr Leu Pro Pro Pro Pro Pro
105                 110                 115                 120

cca cca ccg ctt cct ctt caa cgt gct gct act atg ccg gag atg aac      438
Pro Pro Pro Leu Pro Leu Gln Arg Ala Ala Thr Met Pro Glu Met Asn
                125                 130                 135
```

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ggt aga tcc ggt ggt ggt cat gct ggt agt gga ctc aac gga att gaa      486
Gly Arg Ser Gly Gly Gly His Ala Gly Ser Gly Leu Asn Gly Ile Glu
            140                 145                 150

gaa gat gga gcc cta gat aac gat gat gat gac gat gat gat gat gat      534
Glu Asp Gly Ala Leu Asp Asn Asp Asp Asp Asp Asp Asp Asp Asp Asp
        155                 160                 165

gac tct gaa atg gag aat cgt gat cgt ttg att agg aaa tcg aga agc      582
Asp Ser Glu Met Glu Asn Arg Asp Arg Leu Ile Arg Lys Ser Arg Ser
    170                 175                 180

cgt gga ggt agt act aga gga aat agg acg acg att gaa gat cat cat      630
Arg Gly Gly Ser Thr Arg Gly Asn Arg Thr Thr Ile Glu Asp His His
185                 190                 195                 200

ctt cag gag gag aaa gct ccg cca cct ccc cct ttg gcg aat tcg cgg      678
Leu Gln Glu Glu Lys Ala Pro Pro Pro Pro Leu Ala Asn Ser Arg
                205                 210                 215

cca att ccg ccg cca cgt cag cat cag cat caa cat cag caa cag caa      726
Pro Ile Pro Pro Pro Arg Gln His Gln His Gln His Gln Gln Gln Gln
            220                 225                 230

caa caa cct ttc tac gat tac ttc ttc cct aat gtt gag aat atg cct      774
Gln Gln Pro Phe Tyr Asp Tyr Phe Phe Pro Asn Val Glu Asn Met Pro
        235                 240                 245

gga act act tta gaa gat act cct cca caa cca caa cca caa cca aca      822
Gly Thr Thr Leu Glu Asp Thr Pro Pro Gln Pro Gln Pro Gln Pro Thr
    250                 255                 260

agg cct gtg cct cct caa cca cat tca cca gtc gtt act gag gat gac      870
Arg Pro Val Pro Pro Gln Pro His Ser Pro Val Val Thr Glu Asp Asp
265                 270                 275                 280

gaa gat gag gag gag gaa gag gag gaa gag gag gag gaa gag gag acg      918
Glu Asp Glu Glu Glu Glu Glu Glu Glu Glu Glu Glu Glu Glu Glu Thr
                285                 290                 295

gtg att gaa cgg aaa cca ctg gtg gag gaa aga ccg aag aga gta gag      966
Val Ile Glu Arg Lys Pro Leu Val Glu Glu Arg Pro Lys Arg Val Glu
            300                 305                 310

gaa gtg acg att gaa ttg gaa aaa gtt act aat ttg aga ggg atg aag     1014
Glu Val Thr Ile Glu Leu Glu Lys Val Thr Asn Leu Arg Gly Met Lys
        315                 320                 325

aag agt aaa ggg ata ggg att ccc gga gag agg aga gga atg cga atg     1062
Lys Ser Lys Gly Ile Gly Ile Pro Gly Glu Arg Arg Gly Met Arg Met
    330                 335                 340

ccg gtg act gcg acg cat ttg gcg aat gta ttc att gag ctt gat gat     1110
Pro Val Thr Ala Thr His Leu Ala Asn Val Phe Ile Glu Leu Asp Asp
345                 350                 355                 360
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aat ttc ttg aaa gct tct gaa agt gct cat gat gtt tct aag atg ctt     1158
Asn Phe Leu Lys Ala Ser Glu Ser Ala His Asp Val Ser Lys Met Leu
                365                 370                 375

gaa gct act agg ctc cat tac cat tct aat ttt gca gat aac cga gga     1206
Glu Ala Thr Arg Leu His Tyr His Ser Asn Phe Ala Asp Asn Arg Gly
            380                 385                 390

cat att gat cac tct gct aga gtg atg cgt gta att aca tgg aat aga     1254
His Ile Asp His Ser Ala Arg Val Met Arg Val Ile Thr Trp Asn Arg
        395                 400                 405

tca ttt aga gga ata cca aat gct gat gat ggg aaa gat gat gtt gat     1302
Ser Phe Arg Gly Ile Pro Asn Ala Asp Asp Gly Lys Asp Asp Val Asp
    410                 415                 420

ttg gaa gag aat gaa act cat gct act gtt ctt gac aaa ttg cta gca     1350
Leu Glu Glu Asn Glu Thr His Ala Thr Val Leu Asp Lys Leu Leu Ala
425                 430                 435                 440

tgg gaa aag aag ctc tat gac gaa gtc aag gct ggc gaa ctc atg aaa     1398
Trp Glu Lys Lys Leu Tyr Asp Glu Val Lys Ala Gly Glu Leu Met Lys
                445                 450                 455

atc gag tac cag aaa aag gtt gct cat tta aat cgg gtg aag aaa cga     1446
Ile Glu Tyr Gln Lys Lys Val Ala His Leu Asn Arg Val Lys Lys Arg
            460                 465                 470

ggt ggc cac tcg gat tca tta gag aga gct aaa gca gca gta agt cat     1494
Gly Gly His Ser Asp Ser Leu Glu Arg Ala Lys Ala Ala Val Ser His
        475                 480                 485

ttg cat aca aga tat ata gtt gat atg caa tcc atg gac tcc aca gtt     1542
Leu His Thr Arg Tyr Ile Val Asp Met Gln Ser Met Asp Ser Thr Val
    490                 495                 500

tca gaa atc aat cgt ctt agg gat gaa caa cta tac cta aag ctc gtt     1590
Ser Glu Ile Asn Arg Leu Arg Asp Glu Gln Leu Tyr Leu Lys Leu Val
505                 510                 515                 520

cac ctt gtt gag gcg atg ggg aag atg tgg gaa atg atg caa ata cat     1638
His Leu Val Glu Ala Met Gly Lys Met Trp Glu Met Met Gln Ile His
                525                 530                 535

cat caa aga caa gct gag atc tca aag gtg ttg aga tct cta gat gtt     1686
His Gln Arg Gln Ala Glu Ile Ser Lys Val Leu Arg Ser Leu Asp Val
            540                 545                 550

tca caa gcg gtg aaa gaa aca aat gat cat cat cac gaa cgc acc atc     1734
Ser Gln Ala Val Lys Glu Thr Asn Asp His His His Glu Arg Thr Ile
        555                 560                 565

cag ctc ttg gca gtg gtt caa gaa tgg cac acg cag ttt tgc agg atg     1782
Gln Leu Leu Ala Val Val Gln Glu Trp His Thr Gln Phe Cys Arg Met
    570                 575                 580

ata gat cat cag aaa gaa tac ata aaa gca ctt ggc gga tgg cta aag     1830
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Ile Asp His Gln Lys Glu Tyr Ile Lys Ala Leu Gly Gly Trp Leu Lys
585                 590                 595                 600

cta aat ctc atc cct atc gaa agc aca ctc aag gag aaa gta tct tcg     1878
Leu Asn Leu Ile Pro Ile Glu Ser Thr Leu Lys Glu Lys Val Ser Ser
                605                 610                 615

cct cct cga gtt ccc aat ccc gca atc caa aaa ctc ctc cac gct tgg     1926
Pro Pro Arg Val Pro Asn Pro Ala Ile Gln Lys Leu Leu His Ala Trp
            620                 625                 630

tat gac cgt tta gac aaa atc ccc gac gaa atg gct aaa agt gcc ata     1974
Tyr Asp Arg Leu Asp Lys Ile Pro Asp Glu Met Ala Lys Ser Ala Ile
        635                 640                 645

atc aat ttc gca gcg gtt gta agc acg ata atg cag cag caa gaa gac     2022
Ile Asn Phe Ala Ala Val Val Ser Thr Ile Met Gln Gln Gln Glu Asp
    650                 655                 660

gag ata agt ctc aga aac aaa tgc gaa gag aca aga aaa gaa ttg gga     2070
Glu Ile Ser Leu Arg Asn Lys Cys Glu Glu Thr Arg Lys Glu Leu Gly
665                 670                 675                 680

aga aaa att aga cag ttt gag gat tgg tac cac aaa tac atc cag aag     2118
Arg Lys Ile Arg Gln Phe Glu Asp Trp Tyr His Lys Tyr Ile Gln Lys
                685                 690                 695

aga gga ccg gag ggg atg aat ccg gat gaa gcg gat aac gat cat aat     2166
Arg Gly Pro Glu Gly Met Asn Pro Asp Glu Ala Asp Asn Asp His Asn
            700                 705                 710

gat gag gtc gct gtg agg caa ttc aat gta gaa caa att aag aag agg     2214
Asp Glu Val Ala Val Arg Gln Phe Asn Val Glu Gln Ile Lys Lys Arg
        715                 720                 725

ttg gaa gaa gaa gaa gaa gct tac cat aga caa agc cat caa gtt aga     2262
Leu Glu Glu Glu Glu Glu Ala Tyr His Arg Gln Ser His Gln Val Arg
    730                 735                 740

gag aag tca ctg gct agt ctt cga act cgc ctc ccc gag ctt ttt cag     2310
Glu Lys Ser Leu Ala Ser Leu Arg Thr Arg Leu Pro Glu Leu Phe Gln
745                 750                 755                 760

gca atg tcc gag gtt gcg tat tca tgt tcg gat atg tat aga gct ata     2358
Ala Met Ser Glu Val Ala Tyr Ser Cys Ser Asp Met Tyr Arg Ala Ile
                765                 770                 775

acg tat gcg agt aag cgg caa agc caa agc gaa cgg cat cag aaa cct     2406
Thr Tyr Ala Ser Lys Arg Gln Ser Gln Ser Glu Arg His Gln Lys Pro
            780                 785                 790

agc cag gga cag agt tcg taa gaactaatgt aagatcagag taatgtcttc        2457
Ser Gln Gly Gln Ser Ser
        795

ttcttctttg atcttgaata tttaagcaca cacatacata caacgtatag ctaaatcttt   2517
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atcattgctt tcttatatta aggttttggc ttttgtaaga aggtttctta catatgagat 2577

tcatatagtg tttgattctt aaggaactgt tctgttgagt aataagaaag ttgtgtattg 2637

aaatagagtt gcatttgtta attttg 2663

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Met Gly Cys Ala Gln Ser Lys Ile Glu Asn Glu Glu Ala Val Thr Arg
1 5 10 15

Cys Lys Glu Arg Lys Gln Leu Met Lys Asp Ala Val Thr Ala Arg Asn
20 25 30

Ala Phe Ala Ala Ala His Ser Ala Tyr Ala Met Ala Leu Lys Asn Thr
35 40 45

Gly Ala Ala Leu Ser Asp Tyr Ser His Gly Glu Phe Leu Val Ser Asn
50 55 60

His Ser Ser Ser Ser Ala Ala Ala Ala Ile Ala Ser Thr Ser Ser Leu
65 70 75 80

Pro Thr Ala Ile Ser Pro Pro Leu Pro Ser Ser Thr Ala Pro Val Ser
85 90 95

Asn Ser Thr Ala Ser Ser Ser Ser Ala Ala Val Pro Gln Pro Ile Pro
100 105 110

Asp Thr Leu Pro Pro Pro Pro Pro Pro Pro Pro Leu Pro Leu Gln Arg
115 120 125

Ala Ala Thr Met Pro Glu Met Asn Gly Arg Ser Gly Gly Gly His Ala
130 135 140

Gly Ser Gly Leu Asn Gly Ile Glu Glu Asp Gly Ala Leu Asp Asn Asp
145 150 155 160

Asp Asp Asp Asp Asp Asp Asp Asp Asp Ser Glu Met Glu Asn Arg Asp
165 170 175

Arg Leu Ile Arg Lys Ser Arg Ser Arg Gly Gly Ser Thr Arg Gly Asn
180 185 190

Arg Thr Thr Ile Glu Asp His His Leu Gln Glu Glu Lys Ala Pro Pro
195 200 205

Pro Pro Pro Leu Ala Asn Ser Arg Pro Ile Pro Pro Pro Arg Gln His
210 215 220

Gln His Gln His Gln Gln Gln Gln Gln Gln Pro Phe Tyr Asp Tyr Phe
225 230 235 240

Phe Pro Asn Val Glu Asn Met Pro Gly Thr Thr Leu Glu Asp Thr Pro
245 250 255

Pro Gln Pro Gln Pro Gln Pro Thr Arg Pro Val Pro Pro Gln Pro His
260 265 270

Ser Pro Val Val Thr Glu Asp Asp Glu Asp Glu Glu Glu Glu Glu Glu
275 280 285

Glu Glu Glu Glu Glu Glu Glu Thr Val Ile Glu Arg Lys Pro Leu Val
290 295 300

Glu Glu Arg Pro Lys Arg Val Glu Glu Val Thr Ile Glu Leu Glu Lys
305 310 315 320

Val Thr Asn Leu Arg Gly Met Lys Lys Ser Lys Gly Ile Gly Ile Pro
325 330 335

Gly Glu Arg Arg Gly Met Arg Met Pro Val Thr Ala Thr His Leu Ala
340 345 350

Asn Val Phe Ile Glu Leu Asp Asp Asn Phe Leu Lys Ala Ser Glu Ser
355 360 365

Ala His Asp Val Ser Lys Met Leu Glu Ala Thr Arg Leu His Tyr His
370 375 380

Ser Asn Phe Ala Asp Asn Arg Gly His Ile Asp His Ser Ala Arg Val
385 390 395 400

Met Arg Val Ile Thr Trp Asn Arg Ser Phe Arg Gly Ile Pro Asn Ala
405 410 415

Asp Asp Gly Lys Asp Asp Val Asp Leu Glu Glu Asn Glu Thr His Ala

420 425 430

Thr Val Leu Asp Lys Leu Leu Ala Trp Glu Lys Lys Leu Tyr Asp Glu
435 440 445

Val Lys Ala Gly Glu Leu Met Lys Ile Glu Tyr Gln Lys Lys Val Ala
450 455 460

His Leu Asn Arg Val Lys Lys Arg Gly Gly His Ser Asp Ser Leu Glu
465 470 475 480

Arg Ala Lys Ala Ala Val Ser His Leu His Thr Arg Tyr Ile Val Asp
485 490 495

Met Gln Ser Met Asp Ser Thr Val Ser Glu Ile Asn Arg Leu Arg Asp
500 505 510

Glu Gln Leu Tyr Leu Lys Leu Val His Leu Val Glu Ala Met Gly Lys
515 520 525

Met Trp Glu Met Met Gln Ile His His Gln Arg Gln Ala Glu Ile Ser
530 535 540

Lys Val Leu Arg Ser Leu Asp Val Ser Gln Ala Val Lys Glu Thr Asn
545 550 555 560

Asp His His His Glu Arg Thr Ile Gln Leu Leu Ala Val Val Gln Glu
565 570 575

Trp His Thr Gln Phe Cys Arg Met Ile Asp His Gln Lys Glu Tyr Ile
580 585 590

Lys Ala Leu Gly Gly Trp Leu Lys Leu Asn Leu Ile Pro Ile Glu Ser
595 600 605

Thr Leu Lys Glu Lys Val Ser Ser Pro Pro Arg Val Pro Asn Pro Ala
610 615 620

Ile Gln Lys Leu Leu His Ala Trp Tyr Asp Arg Leu Asp Lys Ile Pro
625 630 635 640

Asp Glu Met Ala Lys Ser Ala Ile Ile Asn Phe Ala Ala Val Val Ser
645 650 655

Thr Ile Met Gln Gln Gln Glu Asp Glu Ile Ser Leu Arg Asn Lys Cys
660 665 670

Glu Glu Thr Arg Lys Glu Leu Gly Arg Lys Ile Arg Gln Phe Glu Asp
675 680 685

Trp Tyr His Lys Tyr Ile Gln Lys Arg Gly Pro Glu Gly Met Asn Pro
690 695 700

Asp Glu Ala Asp Asn Asp His Asn Asp Glu Val Ala Val Arg Gln Phe
705 710 715 720

Asn Val Glu Gln Ile Lys Lys Arg Leu Glu Glu Glu Glu Glu Ala Tyr
725 730 735

His Arg Gln Ser His Gln Val Arg Glu Lys Ser Leu Ala Ser Leu Arg
740 745 750

Thr Arg Leu Pro Glu Leu Phe Gln Ala Met Ser Glu Val Ala Tyr Ser
755 760 765

Cys Ser Asp Met Tyr Arg Ala Ile Thr Tyr Ala Ser Lys Arg Gln Ser
770 775 780

Gln Ser Glu Arg His Gln Lys Pro Ser Gln Gly Gln Ser Ser
785 790 795

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Met Asp Leu Thr Asp Arg Arg Asn Pro Phe Asn Asn Leu Val Phe Pro
1 5 10 15

ccg ccg cct ccg ccg cca tcc acg acc ttc aca agc cct ata ttc cca 96
Pro Pro Pro Pro Pro Pro Ser Thr Thr Phe Thr Ser Pro Ile Phe Pro
20 25 30

cga aca agc tct tcc ggc acc aat ttc ccc att ctg gcc atc gca gtg 144
Arg Thr Ser Ser Ser Gly Thr Asn Phe Pro Ile Leu Ala Ile Ala Val
35 40 45

att gga atc tta gcc act gcg ttc tta ctt gta agt tac tac atc ttc 192
Ile Gly Ile Leu Ala Thr Ala Phe Leu Leu Val Ser Tyr Tyr Ile Phe
50 55 60

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gtg atc aaa tgc tgt ctt aat tgg cac caa atc gac atc ttt cgc cgc      240
Val Ile Lys Cys Cys Leu Asn Trp His Gln Ile Asp Ile Phe Arg Arg
65                  70                  75                  80

cgc aga cga agc agt gac caa aac cct cta atg att tac tct cct cat      288
Arg Arg Arg Ser Ser Asp Gln Asn Pro Leu Met Ile Tyr Ser Pro His
                85                  90                  95

gag gta aac aga gga cta gac gaa tcc gcc att aga gct atc cca gtc      336
Glu Val Asn Arg Gly Leu Asp Glu Ser Ala Ile Arg Ala Ile Pro Val
            100                 105                 110

ttc aaa ttc aag aag aga gac gtt gtt gca gga gaa gaa gat cag agt      384
Phe Lys Phe Lys Lys Arg Asp Val Val Ala Gly Glu Glu Asp Gln Ser
        115                 120                 125

aag aac tct caa gaa tgc tct gtt tgt tta aac gag ttt caa gaa gac      432
Lys Asn Ser Gln Glu Cys Ser Val Cys Leu Asn Glu Phe Gln Glu Asp
    130                 135                 140

gag aag cta agg att att cct aac tgc tgc cac gtg ttt cac att gat      480
Glu Lys Leu Arg Ile Ile Pro Asn Cys Cys His Val Phe His Ile Asp
145                 150                 155                 160

tgc att gat atc tgg ctt cag ggc aac gca aat tgt ccc ttg tgc aga      528
Cys Ile Asp Ile Trp Leu Gln Gly Asn Ala Asn Cys Pro Leu Cys Arg
                165                 170                 175

acc agc gtt tct tgc gaa gca agt ttc act ctt gac cta atc tct gca      576
Thr Ser Val Ser Cys Glu Ala Ser Phe Thr Leu Asp Leu Ile Ser Ala
            180                 185                 190

ccg agc tct cct cgg gag aat agc cct cat tct cgg aac agg aat ctc      624
Pro Ser Ser Pro Arg Glu Asn Ser Pro His Ser Arg Asn Arg Asn Leu
        195                 200                 205

gaa ccc ggc ctg gtt cta gga ggc gat gat gac ttc gtc gtc ata gag      672
Glu Pro Gly Leu Val Leu Gly Gly Asp Asp Asp Phe Val Val Ile Glu
    210                 215                 220

ctt ggg gcc agt aat ggt aac aac aga gaa agc gtg aga aac ata gac      720
Leu Gly Ala Ser Asn Gly Asn Asn Arg Glu Ser Val Arg Asn Ile Asp
225                 230                 235                 240

ttc ctt acg gag caa gaa agg gtt acc tcg aat gag gtc tcg acc gga      768
Phe Leu Thr Glu Gln Glu Arg Val Thr Ser Asn Glu Val Ser Thr Gly
                245                 250                 255

aac agc ccg aaa tcg gtg agt cct ttg cct ata aag ttt ggt aat cgg      816
Asn Ser Pro Lys Ser Val Ser Pro Leu Pro Ile Lys Phe Gly Asn Arg
            260                 265                 270

gga atg tat aag aaa gaa agg aaa ttt cac aaa gtg acg agt atg gga      864
Gly Met Tyr Lys Lys Glu Arg Lys Phe His Lys Val Thr Ser Met Gly
        275                 280                 285
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gac gaa tgt atc gat act aga ggc aaa gat ggt cat ttt ggt gaa att      912
Asp Glu Cys Ile Asp Thr Arg Gly Lys Asp Gly His Phe Gly Glu Ile
    290                 295                 300

cag ccc ata aga aga tcg atc tcg atg gat tca tca gtg gat cgt cag      960
Gln Pro Ile Arg Arg Ser Ile Ser Met Asp Ser Ser Val Asp Arg Gln
305                 310                 315                 320

ctg tac ttg gcg gtc caa gag gaa atc agc cgg aga aac agg cag att     1008
Leu Tyr Leu Ala Val Gln Glu Glu Ile Ser Arg Arg Asn Arg Gln Ile
                325                 330                 335

ccg gta gct gga gac ggt gaa gat agt agc agt agt ggt ggt ggt aat     1056
Pro Val Ala Gly Asp Gly Glu Asp Ser Ser Ser Ser Gly Gly Gly Asn
            340                 345                 350

agc aga gtc atg aag aga tgt ttc ttc tct ttt gga agt agt aga act     1104
Ser Arg Val Met Lys Arg Cys Phe Phe Ser Phe Gly Ser Ser Arg Thr
        355                 360                 365

tca aaa agt tct tca ata tta cct gtt tat ttg gaa ccc taa             1146
Ser Lys Ser Ser Ser Ile Leu Pro Val Tyr Leu Glu Pro
    370                 375                 380
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Met Asp Leu Thr Asp Arg Arg Asn Pro Phe Asn Asn Leu Val Phe Pro
1               5                   10                  15

Pro Pro Pro Pro Pro Pro Ser Thr Thr Phe Thr Ser Pro Ile Phe Pro
            20                  25                  30

Arg Thr Ser Ser Ser Gly Thr Asn Phe Pro Ile Leu Ala Ile Ala Val
        35                  40                  45

Ile Gly Ile Leu Ala Thr Ala Phe Leu Leu Val Ser Tyr Tyr Ile Phe
    50                  55                  60

Val Ile Lys Cys Cys Leu Asn Trp His Gln Ile Asp Ile Phe Arg Arg
65                  70                  75                  80

Arg Arg Arg Ser Ser Asp Gln Asn Pro Leu Met Ile Tyr Ser Pro His
                85                  90                  95

Glu Val Asn Arg Gly Leu Asp Glu Ser Ala Ile Arg Ala Ile Pro Val
            100                 105                 110

Phe Lys Phe Lys Lys Arg Asp Val Val Ala Gly Glu Glu Asp Gln Ser
        115                 120                 125
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Lys Asn Ser Gln Glu Cys Ser Val Cys Leu Asn Glu Phe Gln Glu Asp
130 135 140

Glu Lys Leu Arg Ile Ile Pro Asn Cys Cys His Val Phe His Ile Asp
145 150 155 160

Cys Ile Asp Ile Trp Leu Gln Gly Asn Ala Asn Cys Pro Leu Cys Arg
165 170 175

Thr Ser Val Ser Cys Glu Ala Ser Phe Thr Leu Asp Leu Ile Ser Ala
180 185 190

Pro Ser Ser Pro Arg Glu Asn Ser Pro His Ser Arg Asn Arg Asn Leu
195 200 205

Glu Pro Gly Leu Val Leu Gly Gly Asp Asp Asp Phe Val Val Ile Glu
210 215 220

Leu Gly Ala Ser Asn Gly Asn Asn Arg Glu Ser Val Arg Asn Ile Asp
225 230 235 240

Phe Leu Thr Glu Gln Glu Arg Val Thr Ser Asn Glu Val Ser Thr Gly
245 250 255

Asn Ser Pro Lys Ser Val Ser Pro Leu Pro Ile Lys Phe Gly Asn Arg
260 265 270

Gly Met Tyr Lys Lys Glu Arg Lys Phe His Lys Val Thr Ser Met Gly
275 280 285

Asp Glu Cys Ile Asp Thr Arg Gly Lys Asp Gly His Phe Gly Glu Ile
290 295 300

Gln Pro Ile Arg Arg Ser Ile Ser Met Asp Ser Ser Val Asp Arg Gln
305 310 315 320

Leu Tyr Leu Ala Val Gln Glu Glu Ile Ser Arg Arg Asn Arg Gln Ile
325 330 335

Pro Val Ala Gly Asp Gly Glu Asp Ser Ser Ser Ser Gly Gly Gly Asn
340 345 350

```
Ser Arg Val Met Lys Arg Cys Phe Phe Ser Phe Gly Ser Ser Arg Thr
        355                 360                 365

Ser Lys Ser Ser Ser Ile Leu Pro Val Tyr Leu Glu Pro
    370                 375                 380
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atg caa cca aca tcc gtc ggt agt agc ggc ggt ggt gac gac gga gga      108
Met Gln Pro Thr Ser Val Gly Ser Ser Gly Gly Gly Asp Asp Gly Gly
1               5                   10                  15

ggc aga gga gga gga gga ggg cta agt aga agt gga cta tct cgg atc      156
Gly Arg Gly Gly Gly Gly Gly Leu Ser Arg Ser Gly Leu Ser Arg Ile
            20                  25                  30

cgt tca gct cca gcg act tgg ctt gaa gct tta ctt gag gaa gat gaa      204
Arg Ser Ala Pro Ala Thr Trp Leu Glu Ala Leu Leu Glu Glu Asp Glu
        35                  40                  45

gaa gag tct ttg aaa cct aat ctt ggt ctc acc gat ttg ctt acc ggg      252
Glu Glu Ser Leu Lys Pro Asn Leu Gly Leu Thr Asp Leu Leu Thr Gly
    50                  55                  60

aac tcg aac gat tta ccg aca agt cgc ggc tcg ttc gag ttc ccg att      300
Asn Ser Asn Asp Leu Pro Thr Ser Arg Gly Ser Phe Glu Phe Pro Ile
65                  70                  75                  80

cct gtt gag caa ggg ttg tat caa caa ggt ggg ttt cac cga cag aat      348
Pro Val Glu Gln Gly Leu Tyr Gln Gln Gly Gly Phe His Arg Gln Asn
                85                  90                  95

agt act ccg gcg gat ttt ctt agt ggt tct gat gga ttt atc caa agc      396
Ser Thr Pro Ala Asp Phe Leu Ser Gly Ser Asp Gly Phe Ile Gln Ser
            100                 105                 110

ttt ggg att cag gcg aat tac gat tac tta tcg ggg aat atc gat gtt      444
Phe Gly Ile Gln Ala Asn Tyr Asp Tyr Leu Ser Gly Asn Ile Asp Val
        115                 120                 125

tct ccg gga agt aag cgg tct aga gaa atg gaa gca ctc ttc tct tct      492
Ser Pro Gly Ser Lys Arg Ser Arg Glu Met Glu Ala Leu Phe Ser Ser
    130                 135                 140

cct gag ttt act tct caa atg aaa gga gag caa agc agc ggt caa gtt      540
Pro Glu Phe Thr Ser Gln Met Lys Gly Glu Gln Ser Ser Gly Gln Val
145                 150                 155                 160

cct acc gga gta tca agc atg tcg gat atg aac atg gag aac ctt atg      588
Pro Thr Gly Val Ser Ser Met Ser Asp Met Asn Met Glu Asn Leu Met
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                165                 170                 175

gag gac tct gtt gct ttt agg gtt cgg gct aaa cgt ggt tgc gca act      636
Glu Asp Ser Val Ala Phe Arg Val Arg Ala Lys Arg Gly Cys Ala Thr
            180                 185                 190

cat ccc cgc agc att gcc gag agg gta cga agg acg cgg att agt gat      684
His Pro Arg Ser Ile Ala Glu Arg Val Arg Arg Thr Arg Ile Ser Asp
        195                 200                 205

cgg ata agg aag cta caa gag ctt gta cct aac atg gac aag caa acc      732
Arg Ile Arg Lys Leu Gln Glu Leu Val Pro Asn Met Asp Lys Gln Thr
    210                 215                 220

aac act gca gac atg tta gaa gaa gca gta gaa tac gtg aaa gtt ctt      780
Asn Thr Ala Asp Met Leu Glu Glu Ala Val Glu Tyr Val Lys Val Leu
225                 230                 235                 240

caa agg cag atc cag gag tta aca gaa gaa cag aag agg tgc aca tgc      828
Gln Arg Gln Ile Gln Glu Leu Thr Glu Glu Gln Lys Arg Cys Thr Cys
                245                 250                 255

ata cct aag gaa gaa caa taa ggtttgctcc tgatttgttt tatatttgct         879
Ile Pro Lys Glu Glu Gln
            260

taacggcaat gatctgatcg aaaaattcga aagatgatct tagcttgaat ttagatggat    939

gtcatgttga aaagtatatt atttgataaa tggatgtagg tgtaatataa aatttttgta    999

caataatgaa gaaagttaaa aagaattaat gaaaacatat attctttatg atataaaaaa   1059

aaaaa                                                              1064

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Met Gln Pro Thr Ser Val Gly Ser Ser Gly Gly Gly Asp Asp Gly Gly
1               5                   10                  15

Gly Arg Gly Gly Gly Gly Gly Leu Ser Arg Ser Gly Leu Ser Arg Ile
            20                  25                  30

Arg Ser Ala Pro Ala Thr Trp Leu Glu Ala Leu Leu Glu Glu Asp Glu
        35                  40                  45

Glu Glu Ser Leu Lys Pro Asn Leu Gly Leu Thr Asp Leu Leu Thr Gly
    50                  55                  60

Asn Ser Asn Asp Leu Pro Thr Ser Arg Gly Ser Phe Glu Phe Pro Ile
65                  70                  75                  80
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Pro Val Glu Gln Gly Leu Tyr Gln Gln Gly Gly Phe His Arg Gln Asn
85 90 95

Ser Thr Pro Ala Asp Phe Leu Ser Gly Ser Asp Gly Phe Ile Gln Ser
100 105 110

Phe Gly Ile Gln Ala Asn Tyr Asp Tyr Leu Ser Gly Asn Ile Asp Val
115 120 125

Ser Pro Gly Ser Lys Arg Ser Arg Glu Met Glu Ala Leu Phe Ser Ser
130 135 140

Pro Glu Phe Thr Ser Gln Met Lys Gly Glu Gln Ser Ser Gly Gln Val
145 150 155 160

Pro Thr Gly Val Ser Ser Met Ser Asp Met Asn Met Glu Asn Leu Met
165 170 175

Glu Asp Ser Val Ala Phe Arg Val Arg Ala Lys Arg Gly Cys Ala Thr
180 185 190

His Pro Arg Ser Ile Ala Glu Arg Val Arg Arg Thr Arg Ile Ser Asp
195 200 205

Arg Ile Arg Lys Leu Gln Glu Leu Val Pro Asn Met Asp Lys Gln Thr
210 215 220

Asn Thr Ala Asp Met Leu Glu Glu Ala Val Glu Tyr Val Lys Val Leu
225 230 235 240

Gln Arg Gln Ile Gln Glu Leu Thr Glu Glu Gln Lys Arg Cys Thr Cys
245 250 255

Ile Pro Lys Glu Glu Gln
260

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Met Gln Pro Glu
1

acc tca gat cag atg ttg tac tcg ttt ctt gcc gga aac gaa gtc ggc 105

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Thr Ser Asp Gln Met Leu Tyr Ser Phe Leu Ala Gly Asn Glu Val Gly
5                   10                  15                  20

ggt gga ggg tac tgc gtc tcc ggc gac tac atg acg act atg cag agc      153
Gly Gly Gly Tyr Cys Val Ser Gly Asp Tyr Met Thr Thr Met Gln Ser
                25                  30                  35

tta tgt ggg tct tcg tcg tcg acg tca tcg tat tac cca ctg gcg atc      201
Leu Cys Gly Ser Ser Ser Ser Thr Ser Ser Tyr Tyr Pro Leu Ala Ile
            40                  45                  50

tcc ggc atc gga gaa acg atg gct caa gac aga gct tta gct gct ttg      249
Ser Gly Ile Gly Glu Thr Met Ala Gln Asp Arg Ala Leu Ala Ala Leu
        55                  60                  65

agg aac cac aaa gaa gct gag aga aga agg aga gag agg atc aat tct      297
Arg Asn His Lys Glu Ala Glu Arg Arg Arg Arg Glu Arg Ile Asn Ser
    70                  75                  80

cat ctc aac aag ctt cgt aac gta ctc tct tgt aat tct aag acc gat      345
His Leu Asn Lys Leu Arg Asn Val Leu Ser Cys Asn Ser Lys Thr Asp
85                  90                  95                  100

aaa gcc aca ctg ctc gcc aaa gta gtt caa cga gtc aga gaa ctt aaa      393
Lys Ala Thr Leu Leu Ala Lys Val Val Gln Arg Val Arg Glu Leu Lys
                105                 110                 115

cag caa acc cta gag acc tcc gac tcc gac caa aca tta tta cca tca      441
Gln Gln Thr Leu Glu Thr Ser Asp Ser Asp Gln Thr Leu Leu Pro Ser
            120                 125                 130

gag acc gac gaa att agt gtt cta cac ttt gga gac tat tca aac gac      489
Glu Thr Asp Glu Ile Ser Val Leu His Phe Gly Asp Tyr Ser Asn Asp
        135                 140                 145

ggt cat ata atc ttc aaa gcc tct cta tgt tgt gaa gat aga tca gat      537
Gly His Ile Ile Phe Lys Ala Ser Leu Cys Cys Glu Asp Arg Ser Asp
    150                 155                 160

ctc ttg ccg gac ctt atg gag att ctc aag tct ctt aac atg aag act      585
Leu Leu Pro Asp Leu Met Glu Ile Leu Lys Ser Leu Asn Met Lys Thr
165                 170                 175                 180

ctc cga gct gag atg gta acc att ggt ggt cgg aca aga agt gtt ctt      633
Leu Arg Ala Glu Met Val Thr Ile Gly Gly Arg Thr Arg Ser Val Leu
                185                 190                 195

gtc gta gct gct gac aaa gag atg cac ggc gtc gag tct gtg cat ttt      681
Val Val Ala Ala Asp Lys Glu Met His Gly Val Glu Ser Val His Phe
            200                 205                 210

ttg caa aat gct ctc aag tcg ctg ctt gag cgg tca agc aag tcg ttg      729
Leu Gln Asn Ala Leu Lys Ser Leu Leu Glu Arg Ser Ser Lys Ser Leu
        215                 220                 225

atg gaa cgt agt tct ggt ggt gga gga gga gaa cgg tca aag cgg cgt      777
Met Glu Arg Ser Ser Gly Gly Gly Gly Gly Glu Arg Ser Lys Arg Arg
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230 235 240

cgt gcg ctg gat cac atc ata atg gtg tga aatgatgaga attgagcaca 827
Arg Ala Leu Asp His Ile Ile Met Val
245 250

ctaaaaagtc tataattgat taatatatat agggtatgat cataattaac ttggttataa 887

ttaccaaaac ctttttttatt cctctttaat aatatatatg ttatatggtt ttagttacta 947

agtcttggga gtgtaagcaa atgttgtaag taggtttggt gtgttctttt tcttttcttt 1007

ttttttttctt tttcaaaaaa aaaaaaaaaa 1037

<210> 184 <211> 253 <212> PRT <213> Arabidopsis thaliana <400> 184

Met Gln Pro Glu Thr Ser Asp Gln Met Leu Tyr Ser Phe Leu Ala Gly
1 5 10 15

Asn Glu Val Gly Gly Gly Gly Tyr Cys Val Ser Gly Asp Tyr Met Thr
20 25 30

Thr Met Gln Ser Leu Cys Gly Ser Ser Ser Ser Thr Ser Ser Tyr Tyr
35 40 45

Pro Leu Ala Ile Ser Gly Ile Gly Glu Thr Met Ala Gln Asp Arg Ala
50 55 60

Leu Ala Ala Leu Arg Asn His Lys Glu Ala Glu Arg Arg Arg Arg Glu
65 70 75 80

Arg Ile Asn Ser His Leu Asn Lys Leu Arg Asn Val Leu Ser Cys Asn
85 90 95

Ser Lys Thr Asp Lys Ala Thr Leu Leu Ala Lys Val Val Gln Arg Val
100 105 110

Arg Glu Leu Lys Gln Gln Thr Leu Glu Thr Ser Asp Ser Asp Gln Thr
115 120 125

Leu Leu Pro Ser Glu Thr Asp Glu Ile Ser Val Leu His Phe Gly Asp
130 135 140

Tyr Ser Asn Asp Gly His Ile Ile Phe Lys Ala Ser Leu Cys Cys Glu
145 150 155 160

Asp Arg Ser Asp Leu Leu Pro Asp Leu Met Glu Ile Leu Lys Ser Leu
165 170 175

Asn Met Lys Thr Leu Arg Ala Glu Met Val Thr Ile Gly Gly Arg Thr
180 185 190

Arg Ser Val Leu Val Val Ala Ala Asp Lys Glu Met His Gly Val Glu
195 200 205

Ser Val His Phe Leu Gln Asn Ala Leu Lys Ser Leu Leu Glu Arg Ser
210 215 220

Ser Lys Ser Leu Met Glu Arg Ser Ser Gly Gly Gly Gly Gly Glu Arg
225 230 235 240

Ser Lys Arg Arg Arg Ala Leu Asp His Ile Ile Met Val
245 250

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Met
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Gly Asn Tyr Arg Trp Pro Ser Lys Leu Ser Lys Leu Ser Leu Arg Ala
5 10 15

aaa caa acg aat ctg tac cgc gtc att cta atc gcg atc ctc tgc gtc 154
Lys Gln Thr Asn Leu Tyr Arg Val Ile Leu Ile Ala Ile Leu Cys Val
20 25 30

acc ttt tac ttc gtc gga gta tgg caa cac tcc ggc aga gga atc tca 202
Thr Phe Tyr Phe Val Gly Val Trp Gln His Ser Gly Arg Gly Ile Ser
35 40 45

cgc tct tcc att tct aac cac gag ctc acg tcc gtg ccc tgc acg ttt 250
Arg Ser Ser Ile Ser Asn His Glu Leu Thr Ser Val Pro Cys Thr Phe
50 55 60 65

cct cac caa acc aca ccg att ctc aac ttc gcc tcc cgt cac aca gcc 298
Pro His Gln Thr Thr Pro Ile Leu Asn Phe Ala Ser Arg His Thr Ala
70 75 80

cct gac ctt cct ccg acg ata acg gac gcg cgt gtt gtt caa atc ccg 346
Pro Asp Leu Pro Pro Thr Ile Thr Asp Ala Arg Val Val Gln Ile Pro
85 90 95

tcg tgc ggc gtt gaa ttc tcg gag tac acg ccc tgc gag ttc gtg aat 394

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Ser Cys Gly Val Glu Phe Ser Glu Tyr Thr Pro Cys Glu Phe Val Asn
        100                 105                 110

cgg tct ttg aat ttc cca aga gag agg ctt ata tac aga gag aga cac      442
Arg Ser Leu Asn Phe Pro Arg Glu Arg Leu Ile Tyr Arg Glu Arg His
    115                 120                 125

tgt ccg gaa aaa cac gag ata gtc agg tgt cgg att cca gcg ccg tac      490
Cys Pro Glu Lys His Glu Ile Val Arg Cys Arg Ile Pro Ala Pro Tyr
130                 135                 140                 145

ggt tac agt tta cct ttt cgg tgg ccg gag agc cgt gac gtg gcg tgg      538
Gly Tyr Ser Leu Pro Phe Arg Trp Pro Glu Ser Arg Asp Val Ala Trp
                150                 155                 160

ttt gct aac gtg ccg cat acg gaa cta acg gtg gag aag aag aat cag      586
Phe Ala Asn Val Pro His Thr Glu Leu Thr Val Glu Lys Lys Asn Gln
            165                 170                 175

aac tgg gta agg tat gag aag gat agg ttt tta ttt cct ggt ggt ggt      634
Asn Trp Val Arg Tyr Glu Lys Asp Arg Phe Leu Phe Pro Gly Gly Gly
        180                 185                 190

acg atg ttt cca cgt gga gct gat gct tac atc gac gag atc gga cgg      682
Thr Met Phe Pro Arg Gly Ala Asp Ala Tyr Ile Asp Glu Ile Gly Arg
    195                 200                 205

ttg ata aat ctc aaa gat gga tca att cgg aca gcc att gat act gga      730
Leu Ile Asn Leu Lys Asp Gly Ser Ile Arg Thr Ala Ile Asp Thr Gly
210                 215                 220                 225

tgt ggg gta gcg agc ttt ggg gcg tat cta atg tcg agg aac ata gta      778
Cys Gly Val Ala Ser Phe Gly Ala Tyr Leu Met Ser Arg Asn Ile Val
                230                 235                 240

acg atg tcg ttt gca cca aga gac aca cac gaa gct cag gtt cag ttc      826
Thr Met Ser Phe Ala Pro Arg Asp Thr His Glu Ala Gln Val Gln Phe
            245                 250                 255

gca ctt gag aga gga gtc cct gcc atc ata gga gtg tta gcc tct att      874
Ala Leu Glu Arg Gly Val Pro Ala Ile Ile Gly Val Leu Ala Ser Ile
        260                 265                 270

agg ctc cca ttt ccg gcc aga gcc ttc gac att gct cat tgc tct cga      922
Arg Leu Pro Phe Pro Ala Arg Ala Phe Asp Ile Ala His Cys Ser Arg
    275                 280                 285

tgt ctc att cct tgg ggc caa tac aac ggg acg tat ctc ata gaa gtg      970
Cys Leu Ile Pro Trp Gly Gln Tyr Asn Gly Thr Tyr Leu Ile Glu Val
290                 295                 300                 305

gat agg gta ctg aga ccg ggg ggg tat tgg att ttg tcg gga ccg ccg     1018
Asp Arg Val Leu Arg Pro Gly Gly Tyr Trp Ile Leu Ser Gly Pro Pro
                310                 315                 320

att aac tgg cag aga cac tgg aag ggt tgg gaa aga act aga gac gat     1066
Ile Asn Trp Gln Arg His Trp Lys Gly Trp Glu Arg Thr Arg Asp Asp
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                325                 330                 335

ctc aac tcg gag cag tct cag atc gag agg gtg gct agg agc ttg tgt    1114
Leu Asn Ser Glu Gln Ser Gln Ile Glu Arg Val Ala Arg Ser Leu Cys
        340                 345                 350

tgg agg aaa ttg gtg cag aga gag gat ctt gcg gtt tgg cag aaa cct    1162
Trp Arg Lys Leu Val Gln Arg Glu Asp Leu Ala Val Trp Gln Lys Pro
    355                 360                 365

acc aac cat gtt cac tgt aag cgc aat cgg ata gct tta gga cgc cct    1210
Thr Asn His Val His Cys Lys Arg Asn Arg Ile Ala Leu Gly Arg Pro
370                 375                 380                 385

ccg ttc tgc cac cgg aca cta ccc aac cag ggc tgg tac act aag ctt    1258
Pro Phe Cys His Arg Thr Leu Pro Asn Gln Gly Trp Tyr Thr Lys Leu
                390                 395                 400

gaa acc tgt ttg acg ccg ttg ccg gaa gta aca gga tct gag atc aaa    1306
Glu Thr Cys Leu Thr Pro Leu Pro Glu Val Thr Gly Ser Glu Ile Lys
            405                 410                 415

gaa gta gcg ggt gga cag ttg gcg aga tgg cct gag aga ttg aat gct    1354
Glu Val Ala Gly Gly Gln Leu Ala Arg Trp Pro Glu Arg Leu Asn Ala
        420                 425                 430

ctt cct ccg agg atc aaa agt gga agc ttg gaa ggg atc act gag gat    1402
Leu Pro Pro Arg Ile Lys Ser Gly Ser Leu Glu Gly Ile Thr Glu Asp
    435                 440                 445

gaa ttt gtc agc aac aca gag aaa tgg cag aga aga gtg tct tac tac    1450
Glu Phe Val Ser Asn Thr Glu Lys Trp Gln Arg Arg Val Ser Tyr Tyr
450                 455                 460                 465

aag aaa tat gac caa cag cta gcg gag acg gga aga tac aga aac ttt    1498
Lys Lys Tyr Asp Gln Gln Leu Ala Glu Thr Gly Arg Tyr Arg Asn Phe
                470                 475                 480

ctc gac atg aac gct cat ctt gga ggt ttc gcc tca gcc tta gtc gat    1546
Leu Asp Met Asn Ala His Leu Gly Gly Phe Ala Ser Ala Leu Val Asp
            485                 490                 495

gat cct gta tgg gtc atg aat gtt gtc ccc gtg gag gcc agt gtt aac    1594
Asp Pro Val Trp Val Met Asn Val Val Pro Val Glu Ala Ser Val Asn
        500                 505                 510

acc ctt gga gtt atc tat gag cga gga ttg att gga acg tat caa aac    1642
Thr Leu Gly Val Ile Tyr Glu Arg Gly Leu Ile Gly Thr Tyr Gln Asn
    515                 520                 525

tgg tgt gaa gca atg tca act tac cca agg aca tac gat ttc atc cat    1690
Trp Cys Glu Ala Met Ser Thr Tyr Pro Arg Thr Tyr Asp Phe Ile His
530                 535                 540                 545

gcc gat tcg gtg ttc agt ctg tac aaa gac aga tgt gac atg gaa gat    1738
Ala Asp Ser Val Phe Ser Leu Tyr Lys Asp Arg Cys Asp Met Glu Asp
                550                 555                 560
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atc ttg cta gaa atg gac agg att cta aga cca aag gga agc gtg atc 1786
Ile Leu Leu Glu Met Asp Arg Ile Leu Arg Pro Lys Gly Ser Val Ile
565 570 575

atc aga gac gac att gat gtg cta acc aaa gtg aag aag att aca gat 1834
Ile Arg Asp Asp Ile Asp Val Leu Thr Lys Val Lys Lys Ile Thr Asp
580 585 590

gcg atg caa tgg gaa ggg agg ata gga gat cat gaa aac gga cct ctt 1882
Ala Met Gln Trp Glu Gly Arg Ile Gly Asp His Glu Asn Gly Pro Leu
595 600 605

gaa aga gag aag att ttg ttt ctt gtg aag gag tac tgg acc gca cct 1930
Glu Arg Glu Lys Ile Leu Phe Leu Val Lys Glu Tyr Trp Thr Ala Pro
610 615 620 625

gcg cct gat cag tca tca gat cct tga tcaagcttgg aataattcat 1977
Ala Pro Asp Gln Ser Ser Asp Pro
630

aaaatttgta gctccattct tttttcttca aatgttttgt acacactaat cgactttggg 2037

ggaaagaaga aacaaacacc cgctaaattg tttcaaaccg gagattcatt gcgactttgt 2097

gagaaaatga actagagagt ttactacaaa 2127

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Met Gly Asn Tyr Arg Trp Pro Ser Lys Leu Ser Lys Leu Ser Leu Arg
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Ala Lys Gln Thr Asn Leu Tyr Arg Val Ile Leu Ile Ala Ile Leu Cys
20 25 30

Val Thr Phe Tyr Phe Val Gly Val Trp Gln His Ser Gly Arg Gly Ile
35 40 45

Ser Arg Ser Ser Ile Ser Asn His Glu Leu Thr Ser Val Pro Cys Thr
50 55 60

Phe Pro His Gln Thr Thr Pro Ile Leu Asn Phe Ala Ser Arg His Thr
65 70 75 80

Ala Pro Asp Leu Pro Pro Thr Ile Thr Asp Ala Arg Val Val Gln Ile
85 90 95

Pro Ser Cys Gly Val Glu Phe Ser Glu Tyr Thr Pro Cys Glu Phe Val
100 105 110

Asn Arg Ser Leu Asn Phe Pro Arg Glu Arg Leu Ile Tyr Arg Glu Arg
115 120 125

His Cys Pro Glu Lys His Glu Ile Val Arg Cys Arg Ile Pro Ala Pro
130 135 140

Tyr Gly Tyr Ser Leu Pro Phe Arg Trp Pro Glu Ser Arg Asp Val Ala
145 150 155 160

Trp Phe Ala Asn Val Pro His Thr Glu Leu Thr Val Glu Lys Lys Asn
165 170 175

Gln Asn Trp Val Arg Tyr Glu Lys Asp Arg Phe Leu Phe Pro Gly Gly
180 185 190

Gly Thr Met Phe Pro Arg Gly Ala Asp Ala Tyr Ile Asp Glu Ile Gly
195 200 205

Arg Leu Ile Asn Leu Lys Asp Gly Ser Ile Arg Thr Ala Ile Asp Thr
210 215 220

Gly Cys Gly Val Ala Ser Phe Gly Ala Tyr Leu Met Ser Arg Asn Ile
225 230 235 240

Val Thr Met Ser Phe Ala Pro Arg Asp Thr His Glu Ala Gln Val Gln
245 250 255

Phe Ala Leu Glu Arg Gly Val Pro Ala Ile Ile Gly Val Leu Ala Ser
260 265 270

Ile Arg Leu Pro Phe Pro Ala Arg Ala Phe Asp Ile Ala His Cys Ser
275 280 285

Arg Cys Leu Ile Pro Trp Gly Gln Tyr Asn Gly Thr Tyr Leu Ile Glu
290 295 300

Val Asp Arg Val Leu Arg Pro Gly Gly Tyr Trp Ile Leu Ser Gly Pro
305 310 315 320

Pro Ile Asn Trp Gln Arg His Trp Lys Gly Trp Glu Arg Thr Arg Asp
325 330 335

Asp Leu Asn Ser Glu Gln Ser Gln Ile Glu Arg Val Ala Arg Ser Leu
340 345 350

Cys Trp Arg Lys Leu Val Gln Arg Glu Asp Leu Ala Val Trp Gln Lys
355 360 365

Pro Thr Asn His Val His Cys Lys Arg Asn Arg Ile Ala Leu Gly Arg
370 375 380

Pro Pro Phe Cys His Arg Thr Leu Pro Asn Gln Gly Trp Tyr Thr Lys
385 390 395 400

Leu Glu Thr Cys Leu Thr Pro Leu Pro Glu Val Thr Gly Ser Glu Ile
405 410 415

Lys Glu Val Ala Gly Gly Gln Leu Ala Arg Trp Pro Glu Arg Leu Asn
420 425 430

Ala Leu Pro Pro Arg Ile Lys Ser Gly Ser Leu Glu Gly Ile Thr Glu
435 440 445

Asp Glu Phe Val Ser Asn Thr Glu Lys Trp Gln Arg Arg Val Ser Tyr
450 455 460

Tyr Lys Lys Tyr Asp Gln Gln Leu Ala Glu Thr Gly Arg Tyr Arg Asn
465 470 475 480

Phe Leu Asp Met Asn Ala His Leu Gly Gly Phe Ala Ser Ala Leu Val
485 490 495

Asp Asp Pro Val Trp Val Met Asn Val Val Pro Val Glu Ala Ser Val
500 505 510

Asn Thr Leu Gly Val Ile Tyr Glu Arg Gly Leu Ile Gly Thr Tyr Gln
515 520 525

Asn Trp Cys Glu Ala Met Ser Thr Tyr Pro Arg Thr Tyr Asp Phe Ile
530 535 540

His Ala Asp Ser Val Phe Ser Leu Tyr Lys Asp Arg Cys Asp Met Glu
545 550 555 560

Asp Ile Leu Leu Glu Met Asp Arg Ile Leu Arg Pro Lys Gly Ser Val

565 570 575

Ile Ile Arg Asp Asp Ile Asp Val Leu Thr Lys Val Lys Lys Ile Thr
580 585 590

Asp Ala Met Gln Trp Glu Gly Arg Ile Gly Asp His Glu Asn Gly Pro
595 600 605

Leu Glu Arg Glu Lys Ile Leu Phe Leu Val Lys Glu Tyr Trp Thr Ala
610 615 620

Pro Ala Pro Asp Gln Ser Ser Asp Pro
625 630

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caaccataag acaaaacaac gaacgaggaa gagagagaga gaaggatata tctctaatca 120

cg atg cag gag ata ata ccg gat ttt ctt gaa gag tgt gaa ttt gtc 167
Met Gln Glu Ile Ile Pro Asp Phe Leu Glu Glu Cys Glu Phe Val
1 5 10 15

gac act tca cta gcc gga gat gat cta ttt gcc atc tta gag agt ctt 215
Asp Thr Ser Leu Ala Gly Asp Asp Leu Phe Ala Ile Leu Glu Ser Leu
20 25 30

gaa ggt gcc gga gag ata tct ccg aca gct gca tct aca cct aaa gat 263
Glu Gly Ala Gly Glu Ile Ser Pro Thr Ala Ala Ser Thr Pro Lys Asp
35 40 45

gga acc aca agt tcc aag gag tta gtt aag gat caa gat tat gaa aac 311
Gly Thr Thr Ser Ser Lys Glu Leu Val Lys Asp Gln Asp Tyr Glu Asn
50 55 60

tca tct cct aag agg aaa aag caa aga cta gaa acc agg aaa gaa gag 359
Ser Ser Pro Lys Arg Lys Lys Gln Arg Leu Glu Thr Arg Lys Glu Glu
65 70 75

gac gaa gaa gaa gaa gac gga gac gga gaa gca gaa gaa gat aat aag 407
Asp Glu Glu Glu Glu Asp Gly Asp Gly Glu Ala Glu Glu Asp Asn Lys
80 85 90 95

caa gat ggg caa caa aag atg tct cat gta acc gtg gaa cgt aac cgg 455
Gln Asp Gly Gln Gln Lys Met Ser His Val Thr Val Glu Arg Asn Arg
100 105 110

aga aag caa atg aac gag cac tta acc gtt ttg cgt tct ctt atg cct 503
Arg Lys Gln Met Asn Glu His Leu Thr Val Leu Arg Ser Leu Met Pro

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            115                 120                 125

tgt ttc tac gtc aaa cgg ggg gac caa gca tcg atc ata gga gga gtt      551
Cys Phe Tyr Val Lys Arg Gly Asp Gln Ala Ser Ile Ile Gly Gly Val
        130                 135                 140

gtg gag tac ata agc gag tta caa caa gtt ctc caa tct ttg gaa gcc      599
Val Glu Tyr Ile Ser Glu Leu Gln Gln Val Leu Gln Ser Leu Glu Ala
    145                 150                 155

aag aaa caa cgt aaa acc tac gcc gaa gtc cta agc ccg aga gtt gtc      647
Lys Lys Gln Arg Lys Thr Tyr Ala Glu Val Leu Ser Pro Arg Val Val
160                 165                 170                 175

ccg agc cct cgt cct tca ccg cct gtt cta agc cca aga aaa ccg cct      695
Pro Ser Pro Arg Pro Ser Pro Pro Val Leu Ser Pro Arg Lys Pro Pro
                180                 185                 190

ctt agc ccg cgc atc aac cac cac cag att cac cac cac cta ctt ctc      743
Leu Ser Pro Arg Ile Asn His His Gln Ile His His His Leu Leu Leu
            195                 200                 205

cct ccc ata agt cct cga aca cct cag cca aca agc cca tac cgg gcc      791
Pro Pro Ile Ser Pro Arg Thr Pro Gln Pro Thr Ser Pro Tyr Arg Ala
        210                 215                 220

att cca ccg caa cta cca ctc atc cca cag cct ccg ctt cgc tct tac      839
Ile Pro Pro Gln Leu Pro Leu Ile Pro Gln Pro Pro Leu Arg Ser Tyr
    225                 230                 235

agc tca ttg gcc agt tgc agc agc tta gga gat cca cct cca tac tct      887
Ser Ser Leu Ala Ser Cys Ser Ser Leu Gly Asp Pro Pro Pro Tyr Ser
240                 245                 250                 255

cct gct tca tct tct tca tct cct tca gtt agt agt aac cat gag agt      935
Pro Ala Ser Ser Ser Ser Ser Pro Ser Val Ser Ser Asn His Glu Ser
                260                 265                 270

agt gtg atc aat gag ctt gtt gct aac tca aaa tcg gct ttg gct gat      983
Ser Val Ile Asn Glu Leu Val Ala Asn Ser Lys Ser Ala Leu Ala Asp
            275                 280                 285

gtg gaa gtg aag ttt tca gga gct aac gtg ctg ctc aaa acg gtg tcg     1031
Val Glu Val Lys Phe Ser Gly Ala Asn Val Leu Leu Lys Thr Val Ser
        290                 295                 300

cat aag atc ccg gga caa gtt atg aag ata att gct gct ctt gaa gat     1079
His Lys Ile Pro Gly Gln Val Met Lys Ile Ile Ala Ala Leu Glu Asp
    305                 310                 315

ttg gct ctt gag att ctt cag gtt aat att aac acc gtc gac gaa acc     1127
Leu Ala Leu Glu Ile Leu Gln Val Asn Ile Asn Thr Val Asp Glu Thr
320                 325                 330                 335

atg ctt aat tct ttc acc atc aag att gga att gag tgc caa cta agt     1175
Met Leu Asn Ser Phe Thr Ile Lys Ile Gly Ile Glu Cys Gln Leu Ser
                340                 345                 350
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gca gaa gaa ctg gct caa caa att cag caa aca ttc tgc tag 1217
Ala Glu Glu Leu Ala Gln Gln Ile Gln Gln Thr Phe Cys
355 360

taaagaagga tttaatatag cttcgtataa accttaacga gagagcagta cgtactcact 1277

ttctctcctt agtatccctt taattatctt ttcagttttc tgcaaagata tggagtttaa 1337

aaaaataaaa ttgttatcta aagttttaat caaatattga ttaattataa ctaatatagg 1397

tataagtgag ttttaaagat tatcagcttc ataacagcca tcgtcatgtt tactttcttt 1457

taaattttag aatttagacg tactcctacc atgtaatttt atttctgtca ttacatcaag 1517

cattgtagct gtaattgcat atgaatgaac aatagtgtat gagtgatctc atgaataata 1577

ttcttcttgc aacacaaaaa aaaaaaa 1604

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Thr Ser Leu Ala Gly Asp Asp Leu Phe Ala Ile Leu Glu Ser Leu Glu
20 25 30

Gly Ala Gly Glu Ile Ser Pro Thr Ala Ala Ser Thr Pro Lys Asp Gly
35 40 45

Thr Thr Ser Ser Lys Glu Leu Val Lys Asp Gln Asp Tyr Glu Asn Ser
50 55 60

Ser Pro Lys Arg Lys Lys Gln Arg Leu Glu Thr Arg Lys Glu Glu Asp
65 70 75 80

Glu Glu Glu Glu Asp Gly Asp Gly Glu Ala Glu Glu Asp Asn Lys Gln
85 90 95

Asp Gly Gln Gln Lys Met Ser His Val Thr Val Glu Arg Asn Arg Arg
100 105 110

Lys Gln Met Asn Glu His Leu Thr Val Leu Arg Ser Leu Met Pro Cys
115 120 125

Phe Tyr Val Lys Arg Gly Asp Gln Ala Ser Ile Ile Gly Gly Val Val
130 135 140

Glu Tyr Ile Ser Glu Leu Gln Gln Val Leu Gln Ser Leu Glu Ala Lys
145 150 155 160

Lys Gln Arg Lys Thr Tyr Ala Glu Val Leu Ser Pro Arg Val Val Pro
165 170 175

Ser Pro Arg Pro Ser Pro Pro Val Leu Ser Pro Arg Lys Pro Pro Leu
180 185 190

Ser Pro Arg Ile Asn His His Gln Ile His His His Leu Leu Leu Pro
195 200 205

Pro Ile Ser Pro Arg Thr Pro Gln Pro Thr Ser Pro Tyr Arg Ala Ile
210 215 220

Pro Pro Gln Leu Pro Leu Ile Pro Gln Pro Pro Leu Arg Ser Tyr Ser
225 230 235 240

Ser Leu Ala Ser Cys Ser Ser Leu Gly Asp Pro Pro Pro Tyr Ser Pro
245 250 255

Ala Ser Ser Ser Ser Ser Pro Ser Val Ser Ser Asn His Glu Ser Ser
260 265 270

Val Ile Asn Glu Leu Val Ala Asn Ser Lys Ser Ala Leu Ala Asp Val
275 280 285

Glu Val Lys Phe Ser Gly Ala Asn Val Leu Leu Lys Thr Val Ser His
290 295 300

Lys Ile Pro Gly Gln Val Met Lys Ile Ile Ala Ala Leu Glu Asp Leu
305 310 315 320

Ala Leu Glu Ile Leu Gln Val Asn Ile Asn Thr Val Asp Glu Thr Met
325 330 335

Leu Asn Ser Phe Thr Ile Lys Ile Gly Ile Glu Cys Gln Leu Ser Ala
340 345 350

Glu Glu Leu Ala Gln Gln Ile Gln Gln Thr Phe Cys
355 360

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aatctccatg aattgtgggc ccttctcaat tttcttctcc ctgaggtttt tagttcagca 120

gaaacttttg acgagtggtt tcaaatttct ggtgaaaacg accagcaaga agttgttcaa 180

caacttcaca aggttctgcg accatttctt cttcggaggt taaaatcaga tgtagagaaa 240

ggcttacctc caaaaaagga gacaatactc aaagttggc atg tct caa atg caa 294
Met Ser Gln Met Gln
1 5

aaa cag tac tac aag gct tta ctg cag aag gat ctt gaa gtg gtt aat 342
Lys Gln Tyr Tyr Lys Ala Leu Leu Gln Lys Asp Leu Glu Val Val Asn
10 15 20

ggt ggt gga gaa cgc aaa cgt ctg ttg aac ata gca atg caa ttg cgg 390
Gly Gly Gly Glu Arg Lys Arg Leu Leu Asn Ile Ala Met Gln Leu Arg
25 30 35

aaa tgc tgc aat cac cct tat ctc ttc cag ggt gcg gag cct ggt ccc 438
Lys Cys Cys Asn His Pro Tyr Leu Phe Gln Gly Ala Glu Pro Gly Pro
40 45 50

cca tat act aca gga gat cac ctt gta aca aac gca ggt aag atg gtt 486
Pro Tyr Thr Thr Gly Asp His Leu Val Thr Asn Ala Gly Lys Met Val
55 60 65

ctc tta gat aaa ttg cta cct aag ttg aag gat cga gat tca agg gtt 534
Leu Leu Asp Lys Leu Leu Pro Lys Leu Lys Asp Arg Asp Ser Arg Val
70 75 80 85

ctg ata ttt tct cag atg aca agg ctt ttg gat att ctc gag gat tac 582
Leu Ile Phe Ser Gln Met Thr Arg Leu Leu Asp Ile Leu Glu Asp Tyr
90 95 100

cta atg tat cgt ggt tac cag tac tgc cgt att gat gga aat act ggt 630
Leu Met Tyr Arg Gly Tyr Gln Tyr Cys Arg Ile Asp Gly Asn Thr Gly
105 110 115

ggt gac gaa cga gat gct tcc ata gaa gcc tat aac aag cca gga agt 678
Gly Asp Glu Arg Asp Ala Ser Ile Glu Ala Tyr Asn Lys Pro Gly Ser
120 125 130

gag aaa ttc gtt ttc ttg tta tcc act aga gct gga gga ctt ggt atc 726
Glu Lys Phe Val Phe Leu Leu Ser Thr Arg Ala Gly Gly Leu Gly Ile
135 140 145

aat ctt gct act gca gat gtt gtg atc ctc tat gat agt gac tgg aac 774
Asn Leu Ala Thr Ala Asp Val Val Ile Leu Tyr Asp Ser Asp Trp Asn
150 155 160 165

cct caa gtt gac ttg caa gct cag gat cgt gca cat agg att ggt caa 822

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Pro Gln Val Asp Leu Gln Ala Gln Asp Arg Ala His Arg Ile Gly Gln
                170                 175                 180

aaa aaa gaa gtt caa gtg ttc cgg ttc tgc acc gag aat gct att gag      870
Lys Lys Glu Val Gln Val Phe Arg Phe Cys Thr Glu Asn Ala Ile Glu
            185                 190                 195

gct aaa gtc att gag aga gct tac aag aag ttg gca ctt gat gct ctg      918
Ala Lys Val Ile Glu Arg Ala Tyr Lys Lys Leu Ala Leu Asp Ala Leu
        200                 205                 210

gtt att cag caa ggg aga ttg gca gaa cag aaa act gtt aat aag gat      966
Val Ile Gln Gln Gly Arg Leu Ala Glu Gln Lys Thr Val Asn Lys Asp
    215                 220                 225

gag ttg ctt caa atg gtg aga tat ggt gct gaa atg gtg ttt agt tct     1014
Glu Leu Leu Gln Met Val Arg Tyr Gly Ala Glu Met Val Phe Ser Ser
230                 235                 240                 245

aaa gat agc aca att acg gat gag gat att gac aga atc att gcc aaa     1062
Lys Asp Ser Thr Ile Thr Asp Glu Asp Ile Asp Arg Ile Ile Ala Lys
                250                 255                 260

gga gaa gag gca acg gct gaa ctt gat gcc aag atg aag aaa ttt act     1110
Gly Glu Glu Ala Thr Ala Glu Leu Asp Ala Lys Met Lys Lys Phe Thr
            265                 270                 275

gaa gat gca ata cag ttt aaa atg gat gac agt gct gac ttt tat gat     1158
Glu Asp Ala Ile Gln Phe Lys Met Asp Asp Ser Ala Asp Phe Tyr Asp
        280                 285                 290

ttt gac gat gac aac aag gat gag agc aag gtg gat ttt aaa aag att     1206
Phe Asp Asp Asp Asn Lys Asp Glu Ser Lys Val Asp Phe Lys Lys Ile
    295                 300                 305

gtg agt gaa aat tgg aat gat cca cca aaa aga gag aga aag cgc aac     1254
Val Ser Glu Asn Trp Asn Asp Pro Pro Lys Arg Glu Arg Lys Arg Asn
310                 315                 320                 325

tac tct gaa gtt gaa tac ttc aag caa acg ttg cga caa ggt gct cca     1302
Tyr Ser Glu Val Glu Tyr Phe Lys Gln Thr Leu Arg Gln Gly Ala Pro
                330                 335                 340

gct aaa cct aaa gag cct aga att cca cgc atg ccc caa ttg cat gat     1350
Ala Lys Pro Lys Glu Pro Arg Ile Pro Arg Met Pro Gln Leu His Asp
            345                 350                 355

ttt cag ttc ttt aac att cag agg ctg act gag ctg tat gaa aaa gaa     1398
Phe Gln Phe Phe Asn Ile Gln Arg Leu Thr Glu Leu Tyr Glu Lys Glu
        360                 365                 370

gtg cga tac ctt atg caa gca cat cag aaa act caa atg aaa gac aca     1446
Val Arg Tyr Leu Met Gln Ala His Gln Lys Thr Gln Met Lys Asp Thr
    375                 380                 385

att gag gtt gat gaa cct gaa gaa gtt gga gat ccc tta act gct gaa     1494
Ile Glu Val Asp Glu Pro Glu Glu Val Gly Asp Pro Leu Thr Ala Glu
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390                 395                 400                 405

gaa gtg gaa gaa aag gag cta ttg ctg gaa gag ggt ttc tca aca tgg     1542
Glu Val Glu Glu Lys Glu Leu Leu Leu Glu Glu Gly Phe Ser Thr Trp
                410                 415                 420

agc aga aga gac ttc aat gcc ttc att agg gct tgt gag aag tat ggc     1590
Ser Arg Arg Asp Phe Asn Ala Phe Ile Arg Ala Cys Glu Lys Tyr Gly
            425                 430                 435

cgg aac gac ata aag agt att gcc tct gag atg gaa ggg aaa act gag     1638
Arg Asn Asp Ile Lys Ser Ile Ala Ser Glu Met Glu Gly Lys Thr Glu
        440                 445                 450

gaa gag gtt gaa cga tat gct caa gtt ttc caa gtg cga tat aaa gag     1686
Glu Glu Val Glu Arg Tyr Ala Gln Val Phe Gln Val Arg Tyr Lys Glu
    455                 460                 465

ctg aat gat tac gac aga atc atc aag aat att gag aga ggg gaa gca     1734
Leu Asn Asp Tyr Asp Arg Ile Ile Lys Asn Ile Glu Arg Gly Glu Ala
470                 475                 480                 485

aga atc tct agg aaa gat gaa atc atg aaa gct att ggg aag aaa ctg     1782
Arg Ile Ser Arg Lys Asp Glu Ile Met Lys Ala Ile Gly Lys Lys Leu
                490                 495                 500

gat cgc tac aga aac ccg tgg ctg gaa ctg aag att caa tat ggt cag     1830
Asp Arg Tyr Arg Asn Pro Trp Leu Glu Leu Lys Ile Gln Tyr Gly Gln
            505                 510                 515

aac aaa ggg aag ctg tac aat gaa gag tgc gac cgt ttc atg ata tgc     1878
Asn Lys Gly Lys Leu Tyr Asn Glu Glu Cys Asp Arg Phe Met Ile Cys
        520                 525                 530

atg gtc cat aaa ctt ggg tat gga aac tgg gat gag cta aag gca gcg     1926
Met Val His Lys Leu Gly Tyr Gly Asn Trp Asp Glu Leu Lys Ala Ala
    535                 540                 545

ttt cgg aca tcc ccc ttg ttt agg ttt gac tgg ttt gta aaa tcc cgc     1974
Phe Arg Thr Ser Pro Leu Phe Arg Phe Asp Trp Phe Val Lys Ser Arg
550                 555                 560                 565

aca act cag gaa ctt gca agg aga tgt gac aca cta atc agg ttg att     2022
Thr Thr Gln Glu Leu Ala Arg Arg Cys Asp Thr Leu Ile Arg Leu Ile
                570                 575                 580

gag aaa gag aat caa gaa ttt gat gag aga gag agg caa gcc cga aaa     2070
Glu Lys Glu Asn Gln Glu Phe Asp Glu Arg Glu Arg Gln Ala Arg Lys
            585                 590                 595

gag aag aag ctt tca aag agt gca acg cca tca aaa cga cct tcg ggt     2118
Glu Lys Lys Leu Ser Lys Ser Ala Thr Pro Ser Lys Arg Pro Ser Gly
        600                 605                 610

agg caa gca aat gag agc cct tca tct ctt ctg aag aaa cga aag cag     2166
Arg Gln Ala Asn Glu Ser Pro Ser Ser Leu Leu Lys Lys Arg Lys Gln
    615                 620                 625
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ctg tca atg gat gat tat gga aag cgt agg aaa taa gaaggcttgt 2212
Leu Ser Met Asp Asp Tyr Gly Lys Arg Arg Lys
630 635 640

gttgaatcca tcactaagta atcagaaaga tttatgatca cttctaggtt tgattccgaa 2272

tcggagaatt agttagaaga agctccttag agacaaggat ctaatatttt gtacccgcaa 2332

gcatcactgc attgtctccg acttctctta tttcttcaac gtgtatttta ctctattttg 2392

tttgtagaaa tattcaccac attcctagta gtgcgttttt agtaaatctc aaatgaactt 2452

ttgtggtcgg atttgaacaa aaaaaaaaa 2481

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Met Ser Gln Met Gln Lys Gln Tyr Tyr Lys Ala Leu Leu Gln Lys Asp
1 5 10 15

Leu Glu Val Val Asn Gly Gly Gly Glu Arg Lys Arg Leu Leu Asn Ile
20 25 30

Ala Met Gln Leu Arg Lys Cys Cys Asn His Pro Tyr Leu Phe Gln Gly
35 40 45

Ala Glu Pro Gly Pro Pro Tyr Thr Thr Gly Asp His Leu Val Thr Asn
50 55 60

Ala Gly Lys Met Val Leu Leu Asp Lys Leu Leu Pro Lys Leu Lys Asp
65 70 75 80

Arg Asp Ser Arg Val Leu Ile Phe Ser Gln Met Thr Arg Leu Leu Asp
85 90 95

Ile Leu Glu Asp Tyr Leu Met Tyr Arg Gly Tyr Gln Tyr Cys Arg Ile
100 105 110

Asp Gly Asn Thr Gly Gly Asp Glu Arg Asp Ala Ser Ile Glu Ala Tyr
115 120 125

Asn Lys Pro Gly Ser Glu Lys Phe Val Phe Leu Leu Ser Thr Arg Ala
130 135 140

Gly Gly Leu Gly Ile Asn Leu Ala Thr Ala Asp Val Val Ile Leu Tyr
145 150 155 160

09021165 - 060904

Asp Ser Asp Trp Asn Pro Gln Val Asp Leu Gln Ala Gln Asp Arg Ala
165 170 175

His Arg Ile Gly Gln Lys Lys Glu Val Gln Val Phe Arg Phe Cys Thr
180 185 190

Glu Asn Ala Ile Glu Ala Lys Val Ile Glu Arg Ala Tyr Lys Lys Leu
195 200 205

Ala Leu Asp Ala Leu Val Ile Gln Gln Gly Arg Leu Ala Glu Gln Lys
210 215 220

Thr Val Asn Lys Asp Glu Leu Leu Gln Met Val Arg Tyr Gly Ala Glu
225 230 235 240

Met Val Phe Ser Ser Lys Asp Ser Thr Ile Thr Asp Glu Asp Ile Asp
245 250 255

Arg Ile Ile Ala Lys Gly Glu Glu Ala Thr Ala Glu Leu Asp Ala Lys
260 265 270

Met Lys Lys Phe Thr Glu Asp Ala Ile Gln Phe Lys Met Asp Asp Ser
275 280 285

Ala Asp Phe Tyr Asp Phe Asp Asp Asp Asn Lys Asp Glu Ser Lys Val
290 295 300

Asp Phe Lys Lys Ile Val Ser Glu Asn Trp Asn Asp Pro Pro Lys Arg
305 310 315 320

Glu Arg Lys Arg Asn Tyr Ser Glu Val Glu Tyr Phe Lys Gln Thr Leu
325 330 335

Arg Gln Gly Ala Pro Ala Lys Pro Lys Glu Pro Arg Ile Pro Arg Met
340 345 350

Pro Gln Leu His Asp Phe Gln Phe Phe Asn Ile Gln Arg Leu Thr Glu
355 360 365

Leu Tyr Glu Lys Glu Val Arg Tyr Leu Met Gln Ala His Gln Lys Thr
370 375 380

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Gln Met Lys Asp Thr Ile Glu Val Asp Glu Pro Glu Glu Val Gly Asp
385                 390                 395                 400

Pro Leu Thr Ala Glu Glu Val Glu Glu Lys Glu Leu Leu Leu Glu Glu
                405                 410                 415

Gly Phe Ser Thr Trp Ser Arg Arg Asp Phe Asn Ala Phe Ile Arg Ala
            420                 425                 430

Cys Glu Lys Tyr Gly Arg Asn Asp Ile Lys Ser Ile Ala Ser Glu Met
        435                 440                 445

Glu Gly Lys Thr Glu Glu Glu Val Glu Arg Tyr Ala Gln Val Phe Gln
    450                 455                 460

Val Arg Tyr Lys Glu Leu Asn Asp Tyr Asp Arg Ile Ile Lys Asn Ile
465                 470                 475                 480

Glu Arg Gly Glu Ala Arg Ile Ser Arg Lys Asp Glu Ile Met Lys Ala
                485                 490                 495

Ile Gly Lys Lys Leu Asp Arg Tyr Arg Asn Pro Trp Leu Glu Leu Lys
            500                 505                 510

Ile Gln Tyr Gly Gln Asn Lys Gly Lys Leu Tyr Asn Glu Glu Cys Asp
        515                 520                 525

Arg Phe Met Ile Cys Met Val His Lys Leu Gly Tyr Gly Asn Trp Asp
    530                 535                 540

Glu Leu Lys Ala Ala Phe Arg Thr Ser Pro Leu Phe Arg Phe Asp Trp
545                 550                 555                 560

Phe Val Lys Ser Arg Thr Thr Gln Glu Leu Ala Arg Arg Cys Asp Thr
                565                 570                 575

Leu Ile Arg Leu Ile Glu Lys Glu Asn Gln Glu Phe Asp Glu Arg Glu
            580                 585                 590

Arg Gln Ala Arg Lys Glu Lys Lys Leu Ser Lys Ser Ala Thr Pro Ser
        595                 600                 605

Lys Arg Pro Ser Gly Arg Gln Ala Asn Glu Ser Pro Ser Ser Leu Leu
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    610                 615                 620

Lys Lys Arg Lys Gln Leu Ser Met Asp Asp Tyr Gly Lys Arg Arg Lys
625                 630                 635                 640
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c atg gat cca ttt tta att cag tcc cca ttc tcc ggc ttc tca ccg gaa    109
  Met Asp Pro Phe Leu Ile Gln Ser Pro Phe Ser Gly Phe Ser Pro Glu
  1               5                  10                  15

tat tct atc gga tct tct cca gat tct ttc tca tcc tct tct tct aac      157
Tyr Ser Ile Gly Ser Ser Pro Asp Ser Phe Ser Ser Ser Ser Ser Asn
            20                  25                  30

aat tac tct ctt ccc ttc aac gag aac gac tca gag gaa atg ttt ctc      205
Asn Tyr Ser Leu Pro Phe Asn Glu Asn Asp Ser Glu Glu Met Phe Leu
        35                  40                  45

tac ggt cta atc gag cag tcc acg caa caa acc tat att gac tcg gat      253
Tyr Gly Leu Ile Glu Gln Ser Thr Gln Gln Thr Tyr Ile Asp Ser Asp
    50                  55                  60

agt caa gac ctt ccg atc aaa tcc gta agc tca aga aag tca gag aag      301
Ser Gln Asp Leu Pro Ile Lys Ser Val Ser Ser Arg Lys Ser Glu Lys
65                  70                  75                  80

tct tac aga ggc gta aga cga cgg cca tgg ggg aaa ttc gcg gcg gag      349
Ser Tyr Arg Gly Val Arg Arg Arg Pro Trp Gly Lys Phe Ala Ala Glu
                85                  90                  95

ata aga gat tcg act aga aac ggt att agg gtt tgg ctc ggg acg ttc      397
Ile Arg Asp Ser Thr Arg Asn Gly Ile Arg Val Trp Leu Gly Thr Phe
            100                 105                 110

gaa agc gcg gaa gag gcg gct tta gcc tac gat caa gct gct ttc tcg      445
Glu Ser Ala Glu Glu Ala Ala Leu Ala Tyr Asp Gln Ala Ala Phe Ser
        115                 120                 125

atg aga ggg tcc tcg gcg att ctc aat ttt tcg gcg gag aga gtt caa      493
Met Arg Gly Ser Ser Ala Ile Leu Asn Phe Ser Ala Glu Arg Val Gln
    130                 135                 140

gag tcg ctt tcg gag att aaa tat acc tac gag gat ggt tgt tct ccg      541
Glu Ser Leu Ser Glu Ile Lys Tyr Thr Tyr Glu Asp Gly Cys Ser Pro
145                 150                 155                 160

gtt gtg gcg ttg aag agg aaa cac tcg atg aga cgg aga atg acc aat      589
Val Val Ala Leu Lys Arg Lys His Ser Met Arg Arg Arg Met Thr Asn
                165                 170                 175
```

aag aag acg aaa gat agt gac ttt gat cac cgc tcc gtg aag tta gat 637
Lys Lys Thr Lys Asp Ser Asp Phe Asp His Arg Ser Val Lys Leu Asp
180 185 190

aat gta gtt gtc ttt gag gat ttg gga gaa cag tac ctt gag gag ctt 685
Asn Val Val Val Phe Glu Asp Leu Gly Glu Gln Tyr Leu Glu Glu Leu
195 200 205

ttg ggg tct tct gaa aat agt ggg act tgg tga aagattagga tttgtattag 738
Leu Gly Ser Ser Glu Asn Ser Gly Thr Trp
210 215

ggaccttaag tttgaagtgg ttgattaatt ttaaccctaa tatgtttttt gtttgcttaa 798

atatttgatt ctattgagaa acatcgaaaa cagtttgtat gtacttttgt gatacttggc 858

g 859

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Met Asp Pro Phe Leu Ile Gln Ser Pro Phe Ser Gly Phe Ser Pro Glu
1 5 10 15

Tyr Ser Ile Gly Ser Ser Pro Asp Ser Phe Ser Ser Ser Ser Ser Asn
20 25 30

Asn Tyr Ser Leu Pro Phe Asn Glu Asn Asp Ser Glu Glu Met Phe Leu
35 40 45

Tyr Gly Leu Ile Glu Gln Ser Thr Gln Gln Thr Tyr Ile Asp Ser Asp
50 55 60

Ser Gln Asp Leu Pro Ile Lys Ser Val Ser Ser Arg Lys Ser Glu Lys
65 70 75 80

Ser Tyr Arg Gly Val Arg Arg Arg Pro Trp Gly Lys Phe Ala Ala Glu
85 90 95

Ile Arg Asp Ser Thr Arg Asn Gly Ile Arg Val Trp Leu Gly Thr Phe
100 105 110

Glu Ser Ala Glu Glu Ala Ala Leu Ala Tyr Asp Gln Ala Ala Phe Ser
115 120 125

Met Arg Gly Ser Ser Ala Ile Leu Asn Phe Ser Ala Glu Arg Val Gln
130 135 140

```
Glu Ser Leu Ser Glu Ile Lys Tyr Thr Tyr Glu Asp Gly Cys Ser Pro
145                 150                 155                 160

Val Val Ala Leu Lys Arg Lys His Ser Met Arg Arg Arg Met Thr Asn
                165                 170                 175

Lys Lys Thr Lys Asp Ser Asp Phe Asp His Arg Ser Val Lys Leu Asp
            180                 185                 190

Asn Val Val Val Phe Glu Asp Leu Gly Glu Gln Tyr Leu Glu Glu Leu
        195                 200                 205

Leu Gly Ser Ser Glu Asn Ser Gly Thr Trp
    210                 215
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<222> (152)..(967) <223> G1267

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aagtagagaa taataatcac atcaagattg attataaccc tctcactaat caccttctta     60

atcaccaccc tctccggctc tcaacagaac aacaacaaaa aaacagcttc cgttgtcctg    120

ttccggcgaa atcggacggt cgagatcaat c atg cat cgt aga gca gca att       172
                                    Met His Arg Arg Ala Ala Ile
                                    1               5

caa gaa tcg gat gac gaa gaa gat gag act tac aac gac gtc gtt cct      220
Gln Glu Ser Asp Asp Glu Glu Asp Glu Thr Tyr Asn Asp Val Val Pro
        10                  15                  20

gaa tct cct tct tct tgt gaa gac tca aag atc tca aaa cca act cca      268
Glu Ser Pro Ser Ser Cys Glu Asp Ser Lys Ile Ser Lys Pro Thr Pro
    25                  30                  35

aag aaa agg agg aac gta gag aag aga gtt gtc tca gtt ccg ata gct      316
Lys Lys Arg Arg Asn Val Glu Lys Arg Val Val Ser Val Pro Ile Ala
40                  45                  50                  55

gac gtg gaa gga tct aag agc aga ggc gaa gta tat cca ccg tcc gat      364
Asp Val Glu Gly Ser Lys Ser Arg Gly Glu Val Tyr Pro Pro Ser Asp
                60                  65                  70

tca tgg gcc tgg aga aag tac gga caa aaa ccg atc aaa ggc tcg cct      412
Ser Trp Ala Trp Arg Lys Tyr Gly Gln Lys Pro Ile Lys Gly Ser Pro
            75                  80                  85

tat ccc agg gga tat tac aga tgt agt agc tca aaa gga tgt ccg gcg      460
Tyr Pro Arg Gly Tyr Tyr Arg Cys Ser Ser Ser Lys Gly Cys Pro Ala
        90                  95                  100

agg aag cag gtg gag aga agc cgt gtg gac cct tct aag ctt atg att      508
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Arg Lys Gln Val Glu Arg Ser Arg Val Asp Pro Ser Lys Leu Met Ile
    105                 110                 115

act tac gcc tgc gac cac aat cac cct ttc cct tcc tcc tcc gct aac      556
Thr Tyr Ala Cys Asp His Asn His Pro Phe Pro Ser Ser Ser Ala Asn
120                 125                 130                 135

acc aaa tcc cac cac cgc tcc tcc gtc gtc ctc aaa acc gca aag aaa      604
Thr Lys Ser His His Arg Ser Ser Val Val Leu Lys Thr Ala Lys Lys
                140                 145                 150

gag gaa gaa tac gaa gag gag gaa gaa gaa cta acc gtc acc gcc gca      652
Glu Glu Glu Tyr Glu Glu Glu Glu Glu Glu Leu Thr Val Thr Ala Ala
            155                 160                 165

gag gaa cca ccg gcg gga ctt gat cta agc cac gta gac tca ccg ttg      700
Glu Glu Pro Pro Ala Gly Leu Asp Leu Ser His Val Asp Ser Pro Leu
        170                 175                 180

cta tta ggc ggc tgc tac agc gaa atc gga gag ttc ggg tgg ttc tac      748
Leu Leu Gly Gly Cys Tyr Ser Glu Ile Gly Glu Phe Gly Trp Phe Tyr
    185                 190                 195

gac gcg tcg atc tca tca tca tct ggt tct tcg aat ttc ctc gac gta      796
Asp Ala Ser Ile Ser Ser Ser Ser Gly Ser Ser Asn Phe Leu Asp Val
200                 205                 210                 215

act cta gag aga ggt ttt tca gta ggc caa gag gaa gat gag tct ttg      844
Thr Leu Glu Arg Gly Phe Ser Val Gly Gln Glu Glu Asp Glu Ser Leu
                220                 225                 230

ttc ggt gat ctc ggt gat tta cct gat tgc gcc tcc gtg ttc cgc cgt      892
Phe Gly Asp Leu Gly Asp Leu Pro Asp Cys Ala Ser Val Phe Arg Arg
            235                 240                 245

ggg act gtt gcg acg gag gag caa cat cga aga tgt gat ttt ggc gcc      940
Gly Thr Val Ala Thr Glu Glu Gln His Arg Arg Cys Asp Phe Gly Ala
        250                 255                 260

att cct ttc tgt gat agt tct aga tga gtttgtgtgt gtagccaaaa            987
Ile Pro Phe Cys Asp Ser Ser Arg
    265                 270

ccaaaagaaa aaaacacaat ttttttattt tccactgtaa aggtgtatca atggtggatt   1047

catttttta aaaaaaaaaa aaaaa                                         1072


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Met His Arg Arg Ala Ala Ile Gln Glu Ser Asp Asp Glu Glu Asp Glu
1               5                   10                  15

Thr Tyr Asn Asp Val Val Pro Glu Ser Pro Ser Ser Cys Glu Asp Ser
            20                  25                  30
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Lys Ile Ser Lys Pro Thr Pro Lys Lys Arg Arg Asn Val Glu Lys Arg
35 40 45

Val Val Ser Val Pro Ile Ala Asp Val Glu Gly Ser Lys Ser Arg Gly
50 55 60

Glu Val Tyr Pro Pro Ser Asp Ser Trp Ala Trp Arg Lys Tyr Gly Gln
65 70 75 80

Lys Pro Ile Lys Gly Ser Pro Tyr Pro Arg Gly Tyr Tyr Arg Cys Ser
85 90 95

Ser Ser Lys Gly Cys Pro Ala Arg Lys Gln Val Glu Arg Ser Arg Val
100 105 110

Asp Pro Ser Lys Leu Met Ile Thr Tyr Ala Cys Asp His Asn His Pro
115 120 125

Phe Pro Ser Ser Ser Ala Asn Thr Lys Ser His His Arg Ser Ser Val
130 135 140

Val Leu Lys Thr Ala Lys Lys Glu Glu Glu Tyr Glu Glu Glu Glu Glu
145 150 155 160

Glu Leu Thr Val Thr Ala Ala Glu Glu Pro Pro Ala Gly Leu Asp Leu
165 170 175

Ser His Val Asp Ser Pro Leu Leu Leu Gly Gly Cys Tyr Ser Glu Ile
180 185 190

Gly Glu Phe Gly Trp Phe Tyr Asp Ala Ser Ile Ser Ser Ser Ser Gly
195 200 205

Ser Ser Asn Phe Leu Asp Val Thr Leu Glu Arg Gly Phe Ser Val Gly
210 215 220

Gln Glu Glu Asp Glu Ser Leu Phe Gly Asp Leu Gly Asp Leu Pro Asp
225 230 235 240

Cys Ala Ser Val Phe Arg Arg Gly Thr Val Ala Thr Glu Glu Gln His
245 250 255

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Arg Arg Cys Asp Phe Gly Ala Ile Pro Phe Cys Asp Ser Ser Arg
            260                 265                 270


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<222>  (58)..(579) <223>  G1275

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atg aat gat gca gac aca aac ttg ggg agt agt ttc agc gat gat act      105
Met Asn Asp Ala Asp Thr Asn Leu Gly Ser Ser Phe Ser Asp Asp Thr
1               5                   10                  15

cac tct gtg ttc gag ttt ccg gag cta gac ttg tca gat gaa tgg atg      153
His Ser Val Phe Glu Phe Pro Glu Leu Asp Leu Ser Asp Glu Trp Met
            20                  25                  30

gat gat gat ctt gtg tct gcg gtt tcc ggg atg aat cag tct tat ggt      201
Asp Asp Asp Leu Val Ser Ala Val Ser Gly Met Asn Gln Ser Tyr Gly
        35                  40                  45

tat cag act agt gat gtt gct ggt gct tta ttc tca ggt tct tct agc      249
Tyr Gln Thr Ser Asp Val Ala Gly Ala Leu Phe Ser Gly Ser Ser Ser
    50                  55                  60

tgt ttc agt cat cct gaa tct cca agt acc aaa act tat gtt gct gct      297
Cys Phe Ser His Pro Glu Ser Pro Ser Thr Lys Thr Tyr Val Ala Ala
65                  70                  75                  80

aca gcc act gct tct gcc gac aac caa aac aag aaa gaa aag aaa aaa      345
Thr Ala Thr Ala Ser Ala Asp Asn Gln Asn Lys Lys Glu Lys Lys Lys
                85                  90                  95

att aaa ggg aga gtt gcg ttc aag aca cgg tcc gag gtg gaa gtg ctt      393
Ile Lys Gly Arg Val Ala Phe Lys Thr Arg Ser Glu Val Glu Val Leu
            100                 105                 110

gac gac ggg ttc aag tgg aga aag tat ggg aag aag atg gtg aag aac      441
Asp Asp Gly Phe Lys Trp Arg Lys Tyr Gly Lys Lys Met Val Lys Asn
        115                 120                 125

agc cca cat cca aga aac tac tac aaa tgt tca gtt gat ggc tgt ccc      489
Ser Pro His Pro Arg Asn Tyr Tyr Lys Cys Ser Val Asp Gly Cys Pro
    130                 135                 140

gtg aag aaa agg gtt gaa cga gac aga gat gat ccg agc ttt gtg ata      537
Val Lys Lys Arg Val Glu Arg Asp Arg Asp Asp Pro Ser Phe Val Ile
145                 150                 155                 160

aca act tac gag ggt tcc cac aat cac tca agc atg aac taa              579
Thr Thr Tyr Glu Gly Ser His Asn His Ser Ser Met Asn
                165                 170

gactcgaact aaggctcaag gcgaccatgc tatattcagc acatcttatt ttctatggtt    639

acgaacgata cttaaaactg cttctagttc tttatatcca ttgtaaactg gttgcaggtt    699
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cacaaatttt gagaggttta tgacattcta aatctgtagt acttatata 748

<210> 196 <211> 173 <212> PRT <213> Arabidopsis thaliana <400> 196

Met Asn Asp Ala Asp Thr Asn Leu Gly Ser Ser Phe Ser Asp Asp Thr
1 5 10 15

His Ser Val Phe Glu Phe Pro Glu Leu Asp Leu Ser Asp Glu Trp Met
20 25 30

Asp Asp Asp Leu Val Ser Ala Val Ser Gly Met Asn Gln Ser Tyr Gly
35 40 45

Tyr Gln Thr Ser Asp Val Ala Gly Ala Leu Phe Ser Gly Ser Ser Ser
50 55 60

Cys Phe Ser His Pro Glu Ser Pro Ser Thr Lys Thr Tyr Val Ala Ala
65 70 75 80

Thr Ala Thr Ala Ser Ala Asp Asn Gln Asn Lys Lys Glu Lys Lys Lys
85 90 95

Ile Lys Gly Arg Val Ala Phe Lys Thr Arg Ser Glu Val Glu Val Leu
100 105 110

Asp Asp Gly Phe Lys Trp Arg Lys Tyr Gly Lys Lys Met Val Lys Asn
115 120 125

Ser Pro His Pro Arg Asn Tyr Tyr Lys Cys Ser Val Asp Gly Cys Pro
130 135 140

Val Lys Lys Arg Val Glu Arg Asp Arg Asp Asp Pro Ser Phe Val Ile
145 150 155 160

Thr Thr Tyr Glu Gly Ser His Asn His Ser Ser Met Asn
165 170

<210> 197 <211> 800 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (41)..(757) <223> G1311

<400> 197
aagtataata acacaaagaa acagagtaaa agaaagaaaa atg gat ttt aag aag 55
Met Asp Phe Lys Lys
1 5

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gaa gaa aca ctt cgt aga ggg cca tgg ctc gaa gaa gaa gac gaa cgg      103
Glu Glu Thr Leu Arg Arg Gly Pro Trp Leu Glu Glu Glu Asp Glu Arg
                10                  15                  20

cta gtg aag gtc att agt ctt ttg gga gaa cgt cgt tgg gat tct tta      151
Leu Val Lys Val Ile Ser Leu Leu Gly Glu Arg Arg Trp Asp Ser Leu
            25                  30                  35

gca ata gtt tcc ggt ttg aag agg agt ggt aag agt tgc agg cta agg      199
Ala Ile Val Ser Gly Leu Lys Arg Ser Gly Lys Ser Cys Arg Leu Arg
        40                  45                  50

tgg atg aac tat ctg aat ccg act ctg aag cgt gga ccg atg agt caa      247
Trp Met Asn Tyr Leu Asn Pro Thr Leu Lys Arg Gly Pro Met Ser Gln
    55                  60                  65

gaa gaa gag aga atc atc ttt cag ctc cat gct cta tgg ggt aac aag      295
Glu Glu Glu Arg Ile Ile Phe Gln Leu His Ala Leu Trp Gly Asn Lys
70                  75                  80                  85

tgg tcg aag att gcg aga aga tta ccc ggt agg act gat aac gag ata      343
Trp Ser Lys Ile Ala Arg Arg Leu Pro Gly Arg Thr Asp Asn Glu Ile
                90                  95                  100

aag aac tat tgg aga act cat tat aga aag aaa cag gaa gct caa aac      391
Lys Asn Tyr Trp Arg Thr His Tyr Arg Lys Lys Gln Glu Ala Gln Asn
            105                 110                 115

tat gga aag ctc ttt gag tgg aga gga aat aca gga gaa gaa ttg ttg      439
Tyr Gly Lys Leu Phe Glu Trp Arg Gly Asn Thr Gly Glu Glu Leu Leu
        120                 125                 130

cac aag tat aag gaa aca gag atc act agg aca aag acg acg tct caa      487
His Lys Tyr Lys Glu Thr Glu Ile Thr Arg Thr Lys Thr Thr Ser Gln
    135                 140                 145

gaa cat ggt ttt gtt gaa gtt gtg agc atg gaa agt ggt aaa gaa gcc      535
Glu His Gly Phe Val Glu Val Val Ser Met Glu Ser Gly Lys Glu Ala
150                 155                 160                 165

aac ggt ggt gtt ggt gga aga gaa agc ttc ggt gtt atg aaa tca ccg      583
Asn Gly Gly Val Gly Gly Arg Glu Ser Phe Gly Val Met Lys Ser Pro
                170                 175                 180

tat gaa aat cgg att tcg gat tgg ata tca gag att tct act gac cag      631
Tyr Glu Asn Arg Ile Ser Asp Trp Ile Ser Glu Ile Ser Thr Asp Gln
            185                 190                 195

agt gaa gca aat ctt tca gaa gat cac agc agc aat agc tgc agt gag      679
Ser Glu Ala Asn Leu Ser Glu Asp His Ser Ser Asn Ser Cys Ser Glu
        200                 205                 210

aac aat att aac att ggt act tgg tgg ttt caa gag act agg gac ttt      727
Asn Asn Ile Asn Ile Gly Thr Trp Trp Phe Gln Glu Thr Arg Asp Phe
    215                 220                 225.
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gag gag ttt tca tgt tct cta tgg tca taa ttctaaagtt ggtttattta 777
Glu Glu Phe Ser Cys Ser Leu Trp Ser
230 235

cttttttaaaa aaaaaaaaaa aaa 800

<210> 198 <211> 238 <212> PRT <213> Arabidopsis thaliana <400> 198

Met Asp Phe Lys Lys Glu Glu Thr Leu Arg Arg Gly Pro Trp Leu Glu
1 5 10 15

Glu Glu Asp Glu Arg Leu Val Lys Val Ile Ser Leu Leu Gly Glu Arg
20 25 30

Arg Trp Asp Ser Leu Ala Ile Val Ser Gly Leu Lys Arg Ser Gly Lys
35 40 45

Ser Cys Arg Leu Arg Trp Met Asn Tyr Leu Asn Pro Thr Leu Lys Arg
50 55 60

Gly Pro Met Ser Gln Glu Glu Glu Arg Ile Ile Phe Gln Leu His Ala
65 70 75 80

Leu Trp Gly Asn Lys Trp Ser Lys Ile Ala Arg Arg Leu Pro Gly Arg
85 90 95

Thr Asp Asn Glu Ile Lys Asn Tyr Trp Arg Thr His Tyr Arg Lys Lys
100 105 110

Gln Glu Ala Gln Asn Tyr Gly Lys Leu Phe Glu Trp Arg Gly Asn Thr
115 120 125

Gly Glu Glu Leu Leu His Lys Tyr Lys Glu Thr Glu Ile Thr Arg Thr
130 135 140

Lys Thr Thr Ser Gln Glu His Gly Phe Val Glu Val Val Ser Met Glu
145 150 155 160

Ser Gly Lys Glu Ala Asn Gly Gly Val Gly Gly Arg Glu Ser Phe Gly
165 170 175

Val Met Lys Ser Pro Tyr Glu Asn Arg Ile Ser Asp Trp Ile Ser Glu
180 185 190

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Ile Ser Thr Asp Gln Ser Glu Ala Asn Leu Ser Glu Asp His Ser Ser
        195                 200                 205

Asn Ser Cys Ser Glu Asn Asn Ile Asn Ile Gly Thr Trp Trp Phe Gln
    210                 215                 220

Glu Thr Arg Asp Phe Glu Glu Phe Ser Cys Ser Leu Trp Ser
225                 230                 235
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<210> 199 <211> 1081 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (7)..(849) <223> G1318

<400> 199

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aaaaat atg agg aag cca gag gta gcc att gca gct agt act cac caa        48
       Met Arg Lys Pro Glu Val Ala Ile Ala Ala Ser Thr His Gln
       1               5                   10

gta aag aag atg aag aag gga ctt tgg tct cct gag gaa gac tca aag       96
Val Lys Lys Met Lys Lys Gly Leu Trp Ser Pro Glu Glu Asp Ser Lys
15                  20                  25                  30

ctg atg caa tac atg tta agc aat gga caa gga tgt tgg agt gat gtt      144
Leu Met Gln Tyr Met Leu Ser Asn Gly Gln Gly Cys Trp Ser Asp Val
                35                  40                  45

gcg aaa aac gca gga ctt caa aga tgt ggc aaa agc tgc cgt ctt cgt      192
Ala Lys Asn Ala Gly Leu Gln Arg Cys Gly Lys Ser Cys Arg Leu Arg
            50                  55                  60

tgg atc aac tat ctt cgt cct gac ctc aag cgt ggc gct ttc tct cct      240
Trp Ile Asn Tyr Leu Arg Pro Asp Leu Lys Arg Gly Ala Phe Ser Pro
        65                  70                  75

caa gaa gag gat ctc atc att cgc ttt cat tcc atc ctc ggc aac agg      288
Gln Glu Glu Asp Leu Ile Ile Arg Phe His Ser Ile Leu Gly Asn Arg
    80                  85                  90

tgg tct cag att gca gca cga ttg cct ggt cgg acc gat aac gag atc      336
Trp Ser Gln Ile Ala Ala Arg Leu Pro Gly Arg Thr Asp Asn Glu Ile
95                  100                 105                 110

aag aat ttc tgg aac tca aca ata aag aaa agg cta aag aag atg tcc      384
Lys Asn Phe Trp Asn Ser Thr Ile Lys Lys Arg Leu Lys Lys Met Ser
                115                 120                 125

gat acc tcc aac tta atc aac aac tca tcc tca tca ccc aac aca gca      432
Asp Thr Ser Asn Leu Ile Asn Asn Ser Ser Ser Ser Pro Asn Thr Ala
            130                 135                 140

agc gat tcc tct tct aat tcc gca tct tct ttg gat att aaa gac att      480
Ser Asp Ser Ser Ser Asn Ser Ala Ser Ser Leu Asp Ile Lys Asp Ile
        145                 150                 155

ata gga agc ttc atg tcc tta caa gaa caa ggc ttc gtc aac cct tcc      528
```

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Ile Gly Ser Phe Met Ser Leu Gln Glu Gln Gly Phe Val Asn Pro Ser
    160                 165                 170

ttg acc cac ata caa acc aac aat cca ttt cca acg gga aac atg atc      576
Leu Thr His Ile Gln Thr Asn Asn Pro Phe Pro Thr Gly Asn Met Ile
175                 180                 185                 190

agc cac ccg tgc aat gac gat ttt acc cct tat gta gat ggt atc tat      624
Ser His Pro Cys Asn Asp Asp Phe Thr Pro Tyr Val Asp Gly Ile Tyr
                195                 200                 205

gga gta aac gca ggg gta caa ggg gaa ctc tac ttc cca cct ttg gaa      672
Gly Val Asn Ala Gly Val Gln Gly Glu Leu Tyr Phe Pro Pro Leu Glu
            210                 215                 220

tgt gaa gaa ggt gat tgg tac aat gca aat ata aac aac cac tta gac      720
Cys Glu Glu Gly Asp Trp Tyr Asn Ala Asn Ile Asn Asn His Leu Asp
        225                 230                 235

gag ttg aac act aat gga tcc gga aac gca cct gag ggt atg aga cca      768
Glu Leu Asn Thr Asn Gly Ser Gly Asn Ala Pro Glu Gly Met Arg Pro
    240                 245                 250

gtg gaa gaa ttt tgg gac ctt gac cag ttg atg aac act gag gtt cct      816
Val Glu Glu Phe Trp Asp Leu Asp Gln Leu Met Asn Thr Glu Val Pro
255                 260                 265                 270

tcg ttt tac ttc aac ttc aaa caa agc ata tga atatttttac gtcatcttat    869
Ser Phe Tyr Phe Asn Phe Lys Gln Ser Ile
                275                 280

tctttttttct attgcggttt atactcaaga ttcttagcca cacacacata aatgcaaata    929

tatatacatt gttagagagt attttgtatt tcgtataatc ttttcgtact agggcttgag    989

ccttgaggtc ccatgtaacg attagtcaat gtaaaacata tatcctataa taaataaata   1049

aaagaaataa taagcacata aaaaaaaaaa aa                                 1081


<210>  200 <211>  280 <212>  PRT <213>  Arabidopsis thaliana  <400>  200

Met Arg Lys Pro Glu Val Ala Ile Ala Ala Ser Thr His Gln Val Lys
1               5                   10                  15

Lys Met Lys Lys Gly Leu Trp Ser Pro Glu Glu Asp Ser Lys Leu Met
            20                  25                  30

Gln Tyr Met Leu Ser Asn Gly Gln Gly Cys Trp Ser Asp Val Ala Lys
        35                  40                  45

Asn Ala Gly Leu Gln Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp Ile
    50                  55                  60
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Asn Tyr Leu Arg Pro Asp Leu Lys Arg Gly Ala Phe Ser Pro Gln Glu
65                  70                  75                  80

Glu Asp Leu Ile Ile Arg Phe His Ser Ile Leu Gly Asn Arg Trp Ser
                85                  90                  95

Gln Ile Ala Ala Arg Leu Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn
            100                 105                 110

Phe Trp Asn Ser Thr Ile Lys Lys Arg Leu Lys Lys Met Ser Asp Thr
        115                 120                 125

Ser Asn Leu Ile Asn Asn Ser Ser Ser Ser Pro Asn Thr Ala Ser Asp
    130                 135                 140

Ser Ser Ser Asn Ser Ala Ser Ser Leu Asp Ile Lys Asp Ile Ile Gly
145                 150                 155                 160

Ser Phe Met Ser Leu Gln Glu Gln Gly Phe Val Asn Pro Ser Leu Thr
                165                 170                 175

His Ile Gln Thr Asn Asn Pro Phe Pro Thr Gly Asn Met Ile Ser His
            180                 185                 190

Pro Cys Asn Asp Asp Phe Thr Pro Tyr Val Asp Gly Ile Tyr Gly Val
        195                 200                 205

Asn Ala Gly Val Gln Gly Glu Leu Tyr Phe Pro Pro Leu Glu Cys Glu
    210                 215                 220

Glu Gly Asp Trp Tyr Asn Ala Asn Ile Asn Asn His Leu Asp Glu Leu
225                 230                 235                 240

Asn Thr Asn Gly Ser Gly Asn Ala Pro Glu Gly Met Arg Pro Val Glu
                245                 250                 255

Glu Phe Trp Asp Leu Asp Gln Leu Met Asn Thr Glu Val Pro Ser Phe
            260                 265                 270

Tyr Phe Asn Phe Lys Gln Ser Ile
        275                 280
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<222> (72)..(803) <223> G1321

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gttcttgtat tggtttggat cggtatactt agttgattac gtaattaaat agatcggcgt 60

gaagaagaaa a atg atc atg tgc agc cga ggc cat tgg aga cca gct gaa 110
Met Ile Met Cys Ser Arg Gly His Trp Arg Pro Ala Glu
1 5 10

gac gag aag ctc aag gat ctt gtc gaa caa tac ggt cct cac aat tgg 158
Asp Glu Lys Leu Lys Asp Leu Val Glu Gln Tyr Gly Pro His Asn Trp
15 20 25

aac gcc att gct ctc aag ctt cct ggt cgc tct ggt aag agt tgt aga 206
Asn Ala Ile Ala Leu Lys Leu Pro Gly Arg Ser Gly Lys Ser Cys Arg
30 35 40 45

ttg aga tgg ttt aat caa ttg gat cca agg atc aac cga aac cct ttc 254
Leu Arg Trp Phe Asn Gln Leu Asp Pro Arg Ile Asn Arg Asn Pro Phe
50 55 60

acg gaa gaa gaa gaa gaa aga ctt tta gcg gct cat cgg atc cat ggg 302
Thr Glu Glu Glu Glu Glu Arg Leu Leu Ala Ala His Arg Ile His Gly
65 70 75

aac aga tgg tcc atc atc gca agg ctt ttc cct gga aga act gat aac 350
Asn Arg Trp Ser Ile Ile Ala Arg Leu Phe Pro Gly Arg Thr Asp Asn
80 85 90

gcc gtc aag aac cat tgg cac gtc atc atg gct cgt cgc aca cgc caa 398
Ala Val Lys Asn His Trp His Val Ile Met Ala Arg Arg Thr Arg Gln
95 100 105

acc tct aag cct cgt ctt ctt ccc tcg acg act tcg tct tct tct tta 446
Thr Ser Lys Pro Arg Leu Leu Pro Ser Thr Thr Ser Ser Ser Ser Leu
110 115 120 125

atg gcg agt gaa caa atc atg atg agt tct ggt ggt tat aat cat aat 494
Met Ala Ser Glu Gln Ile Met Met Ser Ser Gly Gly Tyr Asn His Asn
130 135 140

tat agt tcc gat gat cgg aag aaa ata ttt cca gca gac ttt ata aat 542
Tyr Ser Ser Asp Asp Arg Lys Lys Ile Phe Pro Ala Asp Phe Ile Asn
145 150 155

ttc cct tac aaa ttc tct cat atc aat cat ctt cac ttc cta aag gag 590
Phe Pro Tyr Lys Phe Ser His Ile Asn His Leu His Phe Leu Lys Glu
160 165 170

ttt ttc ccc gga aag atc gct tta agt cac aaa gca aat cag agt aag 638
Phe Phe Pro Gly Lys Ile Ala Leu Ser His Lys Ala Asn Gln Ser Lys
175 180 185

aag cct atg gag ttc tac aat ttt cta caa gta aac aca gat tca aac 686
Lys Pro Met Glu Phe Tyr Asn Phe Leu Gln Val Asn Thr Asp Ser Asn
190 195 200 205

aag agc gag att ata gat caa gat tca ggt caa agc aaa cgc agt gac 734
Lys Ser Glu Ile Ile Asp Gln Asp Ser Gly Gln Ser Lys Arg Ser Asp
210 215 220

tcg gac acc aaa cat gaa agt cat gtt cca ttc ttc gac ttt tta tcc 782
Ser Asp Thr Lys His Glu Ser His Val Pro Phe Phe Asp Phe Leu Ser
225 230 235

gtt gga aac tct gcc tcc tag gattagtttt tttgcagtaa ctcctaaatt 833
Val Gly Asn Ser Ala Ser
240

tctagattaa ctatttagtc cgtatacgta cgagattatc taggtcgtta gcatgtatgc 893

ttgatgtgta taatcactaa ctagtgagct attacctgcg aaaattgtaa gaaaaataca 953

taatgttgat gtatcacaca ttctcaatgt ctgtaaaatt tccatcgagt tgttaactat 1013

caaagttatc cgtttgaaaa aaaaaaaa 1041

<210> 202 <211> 243 <212> PRT <213> Arabidopsis thaliana <400> 202

Met Ile Met Cys Ser Arg Gly His Trp Arg Pro Ala Glu Asp Glu Lys
1 5 10 15

Leu Lys Asp Leu Val Glu Gln Tyr Gly Pro His Asn Trp Asn Ala Ile
20 25 30

Ala Leu Lys Leu Pro Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp
35 40 45

Phe Asn Gln Leu Asp Pro Arg Ile Asn Arg Asn Pro Phe Thr Glu Glu
50 55 60

Glu Glu Glu Arg Leu Leu Ala Ala His Arg Ile His Gly Asn Arg Trp
65 70 75 80

Ser Ile Ile Ala Arg Leu Phe Pro Gly Arg Thr Asp Asn Ala Val Lys
85 90 95

Asn His Trp His Val Ile Met Ala Arg Arg Thr Arg Gln Thr Ser Lys
100 105 110

Pro Arg Leu Leu Pro Ser Thr Thr Ser Ser Ser Ser Leu Met Ala Ser
115 120 125

Glu Gln Ile Met Met Ser Ser Gly Gly Tyr Asn His Asn Tyr Ser Ser

130 135 140

Asp Asp Arg Lys Lys Ile Phe Pro Ala Asp Phe Ile Asn Phe Pro Tyr
145 150 155 160

Lys Phe Ser His Ile Asn His Leu His Phe Leu Lys Glu Phe Phe Pro
165 170 175

Gly Lys Ile Ala Leu Ser His Lys Ala Asn Gln Ser Lys Lys Pro Met
180 185 190

Glu Phe Tyr Asn Phe Leu Gln Val Asn Thr Asp Ser Asn Lys Ser Glu
195 200 205

Ile Ile Asp Gln Asp Ser Gly Gln Ser Lys Arg Ser Asp Ser Asp Thr
210 215 220

Lys His Glu Ser His Val Pro Phe Phe Asp Phe Leu Ser Val Gly Asn
225 230 235 240

Ser Ala Ser

<210> 203 <211> 1088 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (49)..(870) <223> G1323

<400> 203
aagagggaat ctcaaaagtg tgtgtctgtg agagaggaga gagagaat atg ggc aaa 57
Met Gly Lys
1

gga aga gca cca tgt tgt gac aaa acc aaa gtg aag aga gga cca tgg 105
Gly Arg Ala Pro Cys Cys Asp Lys Thr Lys Val Lys Arg Gly Pro Trp
5 10 15

agc cat gat gaa gac ttg aaa ctc atc tct ttc att cac aag aat ggt 153
Ser His Asp Glu Asp Leu Lys Leu Ile Ser Phe Ile His Lys Asn Gly
20 25 30 35

cat gag aat tgg aga tct ctc cca aag caa gct gga ttg ttg agg tgt 201
His Glu Asn Trp Arg Ser Leu Pro Lys Gln Ala Gly Leu Leu Arg Cys
40 45 50

ggc aag agt tgt cgt ctg cga tgg att aat tac ctc aga cct gat gtg 249
Gly Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Pro Asp Val
55 60 65

aaa cgt ggc aat ttc agt gca gag gaa gaa gac acc atc atc aaa ctt 297
Lys Arg Gly Asn Phe Ser Ala Glu Glu Glu Asp Thr Ile Ile Lys Leu

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        70                  75                  80

cac cag agc ttt ggt aac aag tgg tcg aag att gct tct aag ctg cct      345
His Gln Ser Phe Gly Asn Lys Trp Ser Lys Ile Ala Ser Lys Leu Pro
    85                  90                  95

gga aga aca gac aat gag atc aag aat gtg tgg cat aca cat ctc aag      393
Gly Arg Thr Asp Asn Glu Ile Lys Asn Val Trp His Thr His Leu Lys
100                 105                 110                 115

aaa aga ttg agc tcg gaa act aac ctt aat gcc gat gaa gcg ggt tca      441
Lys Arg Leu Ser Ser Glu Thr Asn Leu Asn Ala Asp Glu Ala Gly Ser
                120                 125                 130

aaa ggt tct ttg aat gaa gaa gag aac tct caa gag tca tct cca aat      489
Lys Gly Ser Leu Asn Glu Glu Glu Asn Ser Gln Glu Ser Ser Pro Asn
            135                 140                 145

gct tca atg tct ttt gct ggt tcc aac att tca agc aaa gac gat gat      537
Ala Ser Met Ser Phe Ala Gly Ser Asn Ile Ser Ser Lys Asp Asp Asp
        150                 155                 160

gca cag ata agt caa atg ttt gag cac att cta act tat agc gag ttt      585
Ala Gln Ile Ser Gln Met Phe Glu His Ile Leu Thr Tyr Ser Glu Phe
    165                 170                 175

acg ggg atg tta caa gag gta gac aaa cca gag ctg ctg gag atg cct      633
Thr Gly Met Leu Gln Glu Val Asp Lys Pro Glu Leu Leu Glu Met Pro
180                 185                 190                 195

ttt gat tta gat cct gac att tgg agt ttc ata gat ggt tca gac tca      681
Phe Asp Leu Asp Pro Asp Ile Trp Ser Phe Ile Asp Gly Ser Asp Ser
                200                 205                 210

ttc caa caa cca gag aac aga gct ctt caa gag tct gaa gaa gat gaa      729
Phe Gln Gln Pro Glu Asn Arg Ala Leu Gln Glu Ser Glu Glu Asp Glu
            215                 220                 225

gtt gat aaa tgg ttt aag cac ctg gaa agc gaa ctc ggg tta gaa gaa      777
Val Asp Lys Trp Phe Lys His Leu Glu Ser Glu Leu Gly Leu Glu Glu
        230                 235                 240

aac gat aac caa caa caa caa cag cat aaa cag gga aca gaa gat gaa      825
Asn Asp Asn Gln Gln Gln Gln Gln His Lys Gln Gly Thr Glu Asp Glu
    245                 250                 255

cat tca tca tca ctc ttg gag agt tac gag ctc ctc ata cat taa          870
His Ser Ser Ser Leu Leu Glu Ser Tyr Glu Leu Leu Ile His
260                 265                 270

tgaagccata aagcaagtca ttttcacctt gaaaatggaa ttattagcta acttattggc    930

attattagta tataagcaag atcagatagg cgcatgtagt agcaacaacg aagaaacgtc    990

gaattgtaga caaaatgtag atattacaga gttgaaagat tgtattttgc aaatgattgc   1050

tttgtagtga aatcaagtta tcacaaaaaa aaaaaaaa                           1088
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<210> 204 <211> 273 <212> PRT <213> Arabidopsis thaliana <400> 204

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Met Gly Lys Gly Arg Ala Pro Cys Cys Asp Lys Thr Lys Val Lys Arg
1               5                  10                  15

Gly Pro Trp Ser His Asp Glu Asp Leu Lys Leu Ile Ser Phe Ile His
            20                  25                  30

Lys Asn Gly His Glu Asn Trp Arg Ser Leu Pro Lys Gln Ala Gly Leu
        35                  40                  45

Leu Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg
    50                  55                  60

Pro Asp Val Lys Arg Gly Asn Phe Ser Ala Glu Glu Glu Asp Thr Ile
65                  70                  75                  80

Ile Lys Leu His Gln Ser Phe Gly Asn Lys Trp Ser Lys Ile Ala Ser
                85                  90                  95

Lys Leu Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn Val Trp His Thr
            100                 105                 110

His Leu Lys Lys Arg Leu Ser Ser Glu Thr Asn Leu Asn Ala Asp Glu
        115                 120                 125

Ala Gly Ser Lys Gly Ser Leu Asn Glu Glu Glu Asn Ser Gln Glu Ser
    130                 135                 140

Ser Pro Asn Ala Ser Met Ser Phe Ala Gly Ser Asn Ile Ser Ser Lys
145                 150                 155                 160

Asp Asp Asp Ala Gln Ile Ser Gln Met Phe Glu His Ile Leu Thr Tyr
                165                 170                 175

Ser Glu Phe Thr Gly Met Leu Gln Glu Val Asp Lys Pro Glu Leu Leu
            180                 185                 190

Glu Met Pro Phe Asp Leu Asp Pro Asp Ile Trp Ser Phe Ile Asp Gly
        195                 200                 205

Ser Asp Ser Phe Gln Gln Pro Glu Asn Arg Ala Leu Gln Glu Ser Glu
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210 215 220

Glu Asp Glu Val Asp Lys Trp Phe Lys His Leu Glu Ser Glu Leu Gly
225 230 235 240

Leu Glu Glu Asn Asp Asn Gln Gln Gln Gln Gln His Lys Gln Gly Thr
245 250 255

Glu Asp Glu His Ser Ser Ser Leu Leu Glu Ser Tyr Glu Leu Leu Ile
260 265 270

His

<210> 205 <211> 880 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (32)..(784) <223> G1326

<400> 205
cgacggtacg gtggagatag agatagcatc c atg gag atg tct aga gga agc 52
Met Glu Met Ser Arg Gly Ser
1 5

aac agt ttt gac aat aag aag cct agt tgc caa aga ggt cac tgg aga 100
Asn Ser Phe Asp Asn Lys Lys Pro Ser Cys Gln Arg Gly His Trp Arg
10 15 20

cct gtt gaa gat gac aat ctc cgg caa ctc gtt gaa caa tac ggt ccc 148
Pro Val Glu Asp Asp Asn Leu Arg Gln Leu Val Glu Gln Tyr Gly Pro
25 30 35

aag aac tgg aat ttt att gct caa cat ctc tat gga aga tca ggg aaa 196
Lys Asn Trp Asn Phe Ile Ala Gln His Leu Tyr Gly Arg Ser Gly Lys
40 45 50 55

agc tgt aga tta aga tgg tac aac caa ctt gat cca aac atc acc aag 244
Ser Cys Arg Leu Arg Trp Tyr Asn Gln Leu Asp Pro Asn Ile Thr Lys
60 65 70

aaa ccc ttc acc gag gag gaa gaa gag aga ctg ctt aaa gct cat cgg 292
Lys Pro Phe Thr Glu Glu Glu Glu Glu Arg Leu Leu Lys Ala His Arg
75 80 85

atc caa ggg aat cgt tgg gcc tcc ata gcc cga ctg ttc ccc ggg agg 340
Ile Gln Gly Asn Arg Trp Ala Ser Ile Ala Arg Leu Phe Pro Gly Arg
90 95 100

acc gac aac gct gtc aaa aac cat ttt cat gtc atc atg gct aga cgc 388
Thr Asp Asn Ala Val Lys Asn His Phe His Val Ile Met Ala Arg Arg
105 110 115

aaa cgg gaa aac ttc tct tcc aca gct act tct acg ttc aac caa act 436
Lys Arg Glu Asn Phe Ser Ser Thr Ala Thr Ser Thr Phe Asn Gln Thr

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120                 125                 130                 135

tgg cat act gtt ttg agc cct agt tct agt ctt aca agg cta aat aga      484
Trp His Thr Val Leu Ser Pro Ser Ser Ser Leu Thr Arg Leu Asn Arg
                140                 145                 150

tcc cat ttc ggg cta tgg agg tat cga aag gat aag agt tgc ggt ctc      532
Ser His Phe Gly Leu Trp Arg Tyr Arg Lys Asp Lys Ser Cys Gly Leu
            155                 160                 165

tgg cct tac tct ttt gtt tca cca cct acg aat ggt caa ttt gga tct      580
Trp Pro Tyr Ser Phe Val Ser Pro Pro Thr Asn Gly Gln Phe Gly Ser
        170                 175                 180

tca tct gtc tct aac gta cac cac gaa att tat ctt gag agg aga aag      628
Ser Ser Val Ser Asn Val His His Glu Ile Tyr Leu Glu Arg Arg Lys
    185                 190                 195

tcg aaa gag ttg gtg gat cct cag aat tac aca ttt cat gca gcc aca      676
Ser Lys Glu Leu Val Asp Pro Gln Asn Tyr Thr Phe His Ala Ala Thr
200                 205                 210                 215

cca gat cat aag atg act tca aat gaa gat gga cca tcc atg gga gat      724
Pro Asp His Lys Met Thr Ser Asn Glu Asp Gly Pro Ser Met Gly Asp
                220                 225                 230

gat ggt gag aag aac gat gtt act ttc att gat ttt ctt ggt gtt gga      772
Asp Gly Glu Lys Asn Asp Val Thr Phe Ile Asp Phe Leu Gly Val Gly
            235                 240                 245

tta gct tct tag gttataacat cacaagtcaa agcttttaag ggtttctatc          824
Leu Ala Ser
        250

attagggtta ggcatcattt tcagcctttt gcttccttaa actctcatat ggatct        880

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Met Glu Met Ser Arg Gly Ser Asn Ser Phe Asp Asn Lys Lys Pro Ser
1               5                   10                  15

Cys Gln Arg Gly His Trp Arg Pro Val Glu Asp Asp Asn Leu Arg Gln
            20                  25                  30

Leu Val Glu Gln Tyr Gly Pro Lys Asn Trp Asn Phe Ile Ala Gln His
        35                  40                  45

Leu Tyr Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp Tyr Asn Gln
    50                  55                  60

Leu Asp Pro Asn Ile Thr Lys Lys Pro Phe Thr Glu Glu Glu Glu Glu
65                  70                  75                  80
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Arg Leu Leu Lys Ala His Arg Ile Gln Gly Asn Arg Trp Ala Ser Ile
85 90 95

Ala Arg Leu Phe Pro Gly Arg Thr Asp Asn Ala Val Lys Asn His Phe
100 105 110

His Val Ile Met Ala Arg Arg Lys Arg Glu Asn Phe Ser Ser Thr Ala
115 120 125

Thr Ser Thr Phe Asn Gln Thr Trp His Thr Val Leu Ser Pro Ser Ser
130 135 140

Ser Leu Thr Arg Leu Asn Arg Ser His Phe Gly Leu Trp Arg Tyr Arg
145 150 155 160

Lys Asp Lys Ser Cys Gly Leu Trp Pro Tyr Ser Phe Val Ser Pro Pro
165 170 175

Thr Asn Gly Gln Phe Gly Ser Ser Ser Val Ser Asn Val His His Glu
180 185 190

Ile Tyr Leu Glu Arg Arg Lys Ser Lys Glu Leu Val Asp Pro Gln Asn
195 200 205

Tyr Thr Phe His Ala Ala Thr Pro Asp His Lys Met Thr Ser Asn Glu
210 215 220

Asp Gly Pro Ser Met Gly Asp Asp Gly Glu Lys Asn Asp Val Thr Phe
225 230 235 240

Ile Asp Phe Leu Gly Val Gly Leu Ala Ser
245 250

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Met Gly Asp Lys Gly Arg
1 5

agc tta aag atc aac aag aac atg gag gaa ttc acg aaa gtg gaa gaa 101
Ser Leu Lys Ile Asn Lys Asn Met Glu Glu Phe Thr Lys Val Glu Glu
10 15 20

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gaa atg gac gta agg aga ggt cca tgg aca gtt gag gaa gat tta gag      149
Glu Met Asp Val Arg Arg Gly Pro Trp Thr Val Glu Glu Asp Leu Glu
        25                  30                  35

ctc atc aat tac att gct agt cat ggt gaa ggt cga tgg aac tct ctc      197
Leu Ile Asn Tyr Ile Ala Ser His Gly Glu Gly Arg Trp Asn Ser Leu
    40                  45                  50

gct cgt tgc gcc gaa ctc aaa agg acc gga aaa agc tgc aga ctt cgg      245
Ala Arg Cys Ala Glu Leu Lys Arg Thr Gly Lys Ser Cys Arg Leu Arg
55                  60                  65                  70

tgg ctg aac tat ctc cga cca gat gtg cgc cgt gga aac ata acc ctc      293
Trp Leu Asn Tyr Leu Arg Pro Asp Val Arg Arg Gly Asn Ile Thr Leu
                75                  80                  85

gaa gaa caa ctc ttg att ctt gaa ctt cac aca cgt tgg ggc aat aga      341
Glu Glu Gln Leu Leu Ile Leu Glu Leu His Thr Arg Trp Gly Asn Arg
            90                  95                  100

tgg tct aag att gca caa tat tta cca gga aga acg gat aac gag atc      389
Trp Ser Lys Ile Ala Gln Tyr Leu Pro Gly Arg Thr Asp Asn Glu Ile
        105                 110                 115

aaa aac tat tgg aga aca cgt gtt caa aag cat gca aaa cag ctt aaa      437
Lys Asn Tyr Trp Arg Thr Arg Val Gln Lys His Ala Lys Gln Leu Lys
    120                 125                 130

tgc gac gtg aac agt caa caa ttt aaa gac acc atg aag tat ctt tgg      485
Cys Asp Val Asn Ser Gln Gln Phe Lys Asp Thr Met Lys Tyr Leu Trp
135                 140                 145                 150

atg cct cgg ctc gta gaa agg atc caa gcc gcg tcc atc ggg tct gtt      533
Met Pro Arg Leu Val Glu Arg Ile Gln Ala Ala Ser Ile Gly Ser Val
                155                 160                 165

tcc atg tca tct tgc gtc acc acc tcc tca gat cag ttc gtg atc aac      581
Ser Met Ser Ser Cys Val Thr Thr Ser Ser Asp Gln Phe Val Ile Asn
            170                 175                 180

aac aac aac acc aac aac gtg gat aat ttg gct tta atg agt aac cct      629
Asn Asn Asn Thr Asn Asn Val Asp Asn Leu Ala Leu Met Ser Asn Pro
        185                 190                 195

aat ggt tac atc acg ccg gat aat tcc agc gtg gca gta tct cct gta      677
Asn Gly Tyr Ile Thr Pro Asp Asn Ser Ser Val Ala Val Ser Pro Val
    200                 205                 210

tca gat ttg acg gag tgt caa gtg agt agt gaa gtg tgg aag att ggt      725
Ser Asp Leu Thr Glu Cys Gln Val Ser Ser Glu Val Trp Lys Ile Gly
215                 220                 225                 230

cag gat gag aat ttg gtg gat cca aaa atg aca tcg ccg aat tat atg      773
Gln Asp Glu Asn Leu Val Asp Pro Lys Met Thr Ser Pro Asn Tyr Met
                235                 240                 245
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gat aat agc agt gga cta tta aac gga gat ttt acg aag atg caa gat      821
Asp Asn Ser Ser Gly Leu Leu Asn Gly Asp Phe Thr Lys Met Gln Asp
            250                 255                 260

caa agt gac ctt aat tgg ttt gaa aat att aat ggg atg gta cca aat      869
Gln Ser Asp Leu Asn Trp Phe Glu Asn Ile Asn Gly Met Val Pro Asn
        265                 270                 275

tat tcg gac agt ttt tgg aac att gga aat gat gaa gac ttc tgg ctc      917
Tyr Ser Asp Ser Phe Trp Asn Ile Gly Asn Asp Glu Asp Phe Trp Leu
    280                 285                 290

tta caa caa cat caa caa gtc cac gac aat gga agc ttc tga              959
Leu Gln Gln His Gln Gln Val His Asp Asn Gly Ser Phe
295                 300                 305

atagacaaga agctatgcgg cc                                            981
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Met Gly Asp Lys Gly Arg Ser Leu Lys Ile Asn Lys Asn Met Glu Glu
1               5                   10                  15

Phe Thr Lys Val Glu Glu Glu Met Asp Val Arg Arg Gly Pro Trp Thr
            20                  25                  30

Val Glu Glu Asp Leu Glu Leu Ile Asn Tyr Ile Ala Ser His Gly Glu
        35                  40                  45

Gly Arg Trp Asn Ser Leu Ala Arg Cys Ala Glu Leu Lys Arg Thr Gly
    50                  55                  60

Lys Ser Cys Arg Leu Arg Trp Leu Asn Tyr Leu Arg Pro Asp Val Arg
65                  70                  75                  80

Arg Gly Asn Ile Thr Leu Glu Glu Gln Leu Leu Ile Leu Glu Leu His
                85                  90                  95

Thr Arg Trp Gly Asn Arg Trp Ser Lys Ile Ala Gln Tyr Leu Pro Gly
            100                 105                 110

Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp Arg Thr Arg Val Gln Lys
        115                 120                 125

His Ala Lys Gln Leu Lys Cys Asp Val Asn Ser Gln Gln Phe Lys Asp
    130                 135                 140
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Thr Met Lys Tyr Leu Trp Met Pro Arg Leu Val Glu Arg Ile Gln Ala
145 150 155 160

Ala Ser Ile Gly Ser Val Ser Met Ser Ser Cys Val Thr Thr Ser Ser
165 170 175

Asp Gln Phe Val Ile Asn Asn Asn Asn Thr Asn Asn Val Asp Asn Leu
180 185 190

Ala Leu Met Ser Asn Pro Asn Gly Tyr Ile Thr Pro Asp Asn Ser Ser
195 200 205

Val Ala Val Ser Pro Val Ser Asp Leu Thr Glu Cys Gln Val Ser Ser
210 215 220

Glu Val Trp Lys Ile Gly Gln Asp Glu Asn Leu Val Asp Pro Lys Met
225 230 235 240

Thr Ser Pro Asn Tyr Met Asp Asn Ser Ser Gly Leu Leu Asn Gly Asp
245 250 255

Phe Thr Lys Met Gln Asp Gln Ser Asp Leu Asn Trp Phe Glu Asn Ile
260 265 270

Asn Gly Met Val Pro Asn Tyr Ser Asp Ser Phe Trp Asn Ile Gly Asn
275 280 285

Asp Glu Asp Phe Trp Leu Leu Gln Gln His Gln Gln Val His Asp Asn
290 295 300

Gly Ser Phe
305

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aaaactaaaa atcaaaaatc tcatcacctt ccttgctctg tatttttttct ctctcactaa 120

atcctcc atg gat cct tct ctc tct gca acc aat gat cct cat cat cct 169
Met Asp Pro Ser Leu Ser Ala Thr Asn Asp Pro His His Pro
1 5 10

cct cct cct cag ttc aca tct ttc cct cct ttc acc aac acc aac ccc 217

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Pro Pro Pro Gln Phe Thr Ser Phe Pro Pro Phe Thr Asn Thr Asn Pro
15                  20                  25                  30

ttc gcc tct cca aac cac ccc ttc ttc acc gga ccc acc gcc gtc gcg      265
Phe Ala Ser Pro Asn His Pro Phe Phe Thr Gly Pro Thr Ala Val Ala
                35                  40                  45

ccg cca aac aac atc cat ctc tat caa gca gct cct ccg cag cag cca      313
Pro Pro Asn Asn Ile His Leu Tyr Gln Ala Ala Pro Pro Gln Gln Pro
            50                  55                  60

caa aca tct cca gtt cct cct cat cca tct att tcc cac cct cct tac      361
Gln Thr Ser Pro Val Pro Pro His Pro Ser Ile Ser His Pro Pro Tyr
        65                  70                  75

tct gac atg att tgc acg gcg att gca gcg tta aac gaa cca gat ggg      409
Ser Asp Met Ile Cys Thr Ala Ile Ala Ala Leu Asn Glu Pro Asp Gly
    80                  85                  90

tca agc aag caa gct att tcg agg tac ata gag aga att tac act ggg      457
Ser Ser Lys Gln Ala Ile Ser Arg Tyr Ile Glu Arg Ile Tyr Thr Gly
95                  100                 105                 110

att cct act gct cat gga gct ttg ttg aca cac cat ctc aag act ttg      505
Ile Pro Thr Ala His Gly Ala Leu Leu Thr His His Leu Lys Thr Leu
                115                 120                 125

aag acc agt ggg att ctt gtc atg gtt aag aaa tct tac aag ctt gct      553
Lys Thr Ser Gly Ile Leu Val Met Val Lys Lys Ser Tyr Lys Leu Ala
            130                 135                 140

tct act cct cct cct cct cct cct act agt gta gct cct agt ctt gaa      601
Ser Thr Pro Pro Pro Pro Pro Pro Thr Ser Val Ala Pro Ser Leu Glu
        145                 150                 155

cct ccc aga tct gat ttc ata gtc aac gag aac caa cct tta cct gat      649
Pro Pro Arg Ser Asp Phe Ile Val Asn Glu Asn Gln Pro Leu Pro Asp
    160                 165                 170

ccg gtt ttg gct tct tct act cct cag act att aaa cgt ggt cgt ggt      697
Pro Val Leu Ala Ser Ser Thr Pro Gln Thr Ile Lys Arg Gly Arg Gly
175                 180                 185                 190

cga cct cca aaa gct aaa cca gat gtt gtt caa cct caa cct ctg act      745
Arg Pro Pro Lys Ala Lys Pro Asp Val Val Gln Pro Gln Pro Leu Thr
                195                 200                 205

aat gga aaa ctc acc tgg gaa cag agt gaa tta cct gtc tct cga cca      793
Asn Gly Lys Leu Thr Trp Glu Gln Ser Glu Leu Pro Val Ser Arg Pro
            210                 215                 220

gag gag ata cag ata cag ccg cca cag tta ccg tta cag cca cag cag      841
Glu Glu Ile Gln Ile Gln Pro Pro Gln Leu Pro Leu Gln Pro Gln Gln
        225                 230                 235

ccg gtt aag aga ccg ccg ggt cgt cct aga aaa gat gga act tcg ccg      889
Pro Val Lys Arg Pro Pro Gly Arg Pro Arg Lys Asp Gly Thr Ser Pro
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    240                 245                 250

acg gtg aag cca gct gct tct gtt tcc ggt ggt gtg gag act gtg aaa      937
Thr Val Lys Pro Ala Ala Ser Val Ser Gly Gly Val Glu Thr Val Lys
255                 260                 265                 270

cga aga ggt aga cct ccg agt gga aga gct gct ggg agg gag aga aag      985
Arg Arg Gly Arg Pro Pro Ser Gly Arg Ala Ala Gly Arg Glu Arg Lys
                275                 280                 285

cct ata gta gtc tca gct cca gct tca gtg ttc ccg tat gtt gct aat     1033
Pro Ile Val Val Ser Ala Pro Ala Ser Val Phe Pro Tyr Val Ala Asn
            290                 295                 300

ggt ggt gtt aga cgc cga ggg aga cca aag aga gtt gac gct ggt ggt     1081
Gly Gly Val Arg Arg Arg Gly Arg Pro Lys Arg Val Asp Ala Gly Gly
        305                 310                 315

gct tcc tct gtt gct cca cca cca cca cca cca act aac gta gag agt     1129
Ala Ser Ser Val Ala Pro Pro Pro Pro Pro Thr Asn Val Glu Ser
    320                 325                 330

gga gga gag gag gtt gca gtc aag aaa cga gga aga gga cgg cct cct     1177
Gly Gly Glu Glu Val Ala Val Lys Lys Arg Gly Arg Gly Arg Pro Pro
335                 340                 345                 350

aag att gga ggt gtt atc agg aag cct atg aag ccg atg aga agc ttt     1225
Lys Ile Gly Gly Val Ile Arg Lys Pro Met Lys Pro Met Arg Ser Phe
                355                 360                 365

gct cgt act gga aaa ccc gta gga aga ccc aga aag aat gcg gtg tca     1273
Ala Arg Thr Gly Lys Pro Val Gly Arg Pro Arg Lys Asn Ala Val Ser
            370                 375                 380

gtg gga gct tct gga cga caa gat ggt gac tat gga gaa ctg aag aag     1321
Val Gly Ala Ser Gly Arg Gln Asp Gly Asp Tyr Gly Glu Leu Lys Lys
        385                 390                 395

aag ttt gag ttg ttt caa gcg aga gct aag gat att gta att gtg ttg     1369
Lys Phe Glu Leu Phe Gln Ala Arg Ala Lys Asp Ile Val Ile Val Leu
    400                 405                 410

aaa tcc gag ata gga gga agt gga aat caa gca gtg gtt caa gcc ata     1417
Lys Ser Glu Ile Gly Gly Ser Gly Asn Gln Ala Val Val Gln Ala Ile
415                 420                 425                 430

cag gac ctg gaa ggg ata gca gag aca aca aac gag cca aag cac atg     1465
Gln Asp Leu Glu Gly Ile Ala Glu Thr Thr Asn Glu Pro Lys His Met
                435                 440                 445

gaa gaa gtg cag ctg cca gac gag gaa cac ctt gaa acc gaa cca gaa     1513
Glu Glu Val Gln Leu Pro Asp Glu Glu His Leu Glu Thr Glu Pro Glu
            450                 455                 460

gca gag ggt caa gga cag aca gaa gca gag gca atg caa gaa gct ctg     1561
Ala Glu Gly Gln Gly Gln Thr Glu Ala Glu Ala Met Gln Glu Ala Leu
        465                 470                 475
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ttc taa agataaagcc ttgacataaa aagctagcaa gtggtgggtt tacttgttgt 1617
Phe

gtgttacatg aaatttttaa tcttataagg gtgtttgcag gagaaaaaca aaaagaacaa 1677

tgtgatgaac tgatgatgat gattgtgtct ctaaccaaac aacaaggaga ggtagggtaa 1737

tgtctgtaaa gtgaattagg atgttaccat tgttcatgct tcccatctct ctccatcgtc 1797

catatctgtg taggcagctt tgttctttgt tccctcgtgt ttttttttaga ctgttgtgtc 1857

tcttattcta ttttgtctcc ttaggctttt taggagttgt tgttgatgtt tatcaaaaac 1917

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Met Asp Pro Ser Leu Ser Ala Thr Asn Asp Pro His His Pro Pro Pro
1 5 10 15

Pro Gln Phe Thr Ser Phe Pro Pro Phe Thr Asn Thr Asn Pro Phe Ala
20 25 30

Ser Pro Asn His Pro Phe Phe Thr Gly Pro Thr Ala Val Ala Pro Pro
35 40 45

Asn Asn Ile His Leu Tyr Gln Ala Ala Pro Pro Gln Gln Pro Gln Thr
50 55 60

Ser Pro Val Pro Pro His Pro Ser Ile Ser His Pro Pro Tyr Ser Asp
65 70 75 80

Met Ile Cys Thr Ala Ile Ala Ala Leu Asn Glu Pro Asp Gly Ser Ser
85 90 95

Lys Gln Ala Ile Ser Arg Tyr Ile Glu Arg Ile Tyr Thr Gly Ile Pro
100 105 110

Thr Ala His Gly Ala Leu Leu Thr His His Leu Lys Thr Leu Lys Thr
115 120 125

Ser Gly Ile Leu Val Met Val Lys Lys Ser Tyr Lys Leu Ala Ser Thr
130 135 140

Pro Pro Pro Pro Pro Pro Thr Ser Val Ala Pro Ser Leu Glu Pro Pro

145 150 155 160

Arg Ser Asp Phe Ile Val Asn Glu Asn Gln Pro Leu Pro Asp Pro Val
165 170 175

Leu Ala Ser Ser Thr Pro Gln Thr Ile Lys Arg Gly Arg Gly Arg Pro
180 185 190

Pro Lys Ala Lys Pro Asp Val Val Gln Pro Gln Pro Leu Thr Asn Gly
195 200 205

Lys Leu Thr Trp Glu Gln Ser Glu Leu Pro Val Ser Arg Pro Glu Glu
210 215 220

Ile Gln Ile Gln Pro Pro Gln Leu Pro Leu Gln Pro Gln Gln Pro Val
225 230 235 240

Lys Arg Pro Pro Gly Arg Pro Arg Lys Asp Gly Thr Ser Pro Thr Val
245 250 255

Lys Pro Ala Ala Ser Val Ser Gly Gly Val Glu Thr Val Lys Arg Arg
260 265 270

Gly Arg Pro Pro Ser Gly Arg Ala Ala Gly Arg Glu Arg Lys Pro Ile
275 280 285

Val Val Ser Ala Pro Ala Ser Val Phe Pro Tyr Val Ala Asn Gly Gly
290 295 300

Val Arg Arg Arg Gly Arg Pro Lys Arg Val Asp Ala Gly Gly Ala Ser
305 310 315 320

Ser Val Ala Pro Pro Pro Pro Pro Pro Thr Asn Val Glu Ser Gly Gly
325 330 335

Glu Glu Val Ala Val Lys Lys Arg Gly Arg Gly Arg Pro Pro Lys Ile
340 345 350

Gly Gly Val Ile Arg Lys Pro Met Lys Pro Met Arg Ser Phe Ala Arg
355 360 365

Thr Gly Lys Pro Val Gly Arg Pro Arg Lys Asn Ala Val Ser Val Gly
370 375 380

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Ala Ser Gly Arg Gln Asp Gly Asp Tyr Gly Glu Leu Lys Lys Lys Phe
385                 390                 395                 400

Glu Leu Phe Gln Ala Arg Ala Lys Asp Ile Val Ile Val Leu Lys Ser
                405                 410                 415

Glu Ile Gly Gly Ser Gly Asn Gln Ala Val Val Gln Ala Ile Gln Asp
            420                 425                 430

Leu Glu Gly Ile Ala Glu Thr Thr Asn Glu Pro Lys His Met Glu Glu
        435                 440                 445

Val Gln Leu Pro Asp Glu Glu His Leu Glu Thr Glu Pro Glu Ala Glu
    450                 455                 460

Gly Gln Gly Gln Thr Glu Ala Glu Ala Met Gln Glu Ala Leu Phe
465                 470                 475

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aaaactcttt atctctgaat cttgagtttc ttgtagaaga agaagcaatt ttgaatcttt    180

cgtaatcata aagattcgtg gaggatctct actgatttgt cggaatctct cactacagaa    240

tcacttgatc ttatgtccgg atg gag gag aga gaa gga acc aac atc aac aac     293
                      Met Glu Glu Arg Glu Gly Thr Asn Ile Asn Asn
                      1               5                   10

aac atc act agc agt ttc ggc ttg aag cag caa cat gaa gct gct gct      341
Asn Ile Thr Ser Ser Phe Gly Leu Lys Gln Gln His Glu Ala Ala Ala
            15                  20                  25

tct gat ggt ggt tac tca atg gac cca cca cca aga ccc gaa aac cct      389
Ser Asp Gly Gly Tyr Ser Met Asp Pro Pro Pro Arg Pro Glu Asn Pro
        30                  35                  40

aac ccg ttt tta gtc cca ccc act act gtc ccc gcg gcc gcc acc gta      437
Asn Pro Phe Leu Val Pro Pro Thr Thr Val Pro Ala Ala Ala Thr Val
    45                  50                  55

gca gca gct gtt act gag aat gcg gct act ccg ttt agc tta aca atg      485
Ala Ala Ala Val Thr Glu Asn Ala Ala Thr Pro Phe Ser Leu Thr Met
60                  65                  70                  75
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ccg acg gag aac act tca gct gag cag ctg aaa aag aag aga ggt agg      533
Pro Thr Glu Asn Thr Ser Ala Glu Gln Leu Lys Lys Lys Arg Gly Arg
                80                  85                  90

ccg aga aag tat aat ccc gat ggg act ctt gtc gtg act tta tcg ccg      581
Pro Arg Lys Tyr Asn Pro Asp Gly Thr Leu Val Val Thr Leu Ser Pro
            95                  100                 105

atg cca atc tcg tcc tct gtt ccg ttg acg tcg gag ttt cct cca agg      629
Met Pro Ile Ser Ser Ser Val Pro Leu Thr Ser Glu Phe Pro Pro Arg
        110                 115                 120

aaa cga gga aga gga cgt ggc aag tct aat cga tgg ctc aag aag tct      677
Lys Arg Gly Arg Gly Arg Gly Lys Ser Asn Arg Trp Leu Lys Lys Ser
    125                 130                 135

caa atg ttc caa ttc gat aga agt cct gtt gat acc aat ttg gca ggt      725
Gln Met Phe Gln Phe Asp Arg Ser Pro Val Asp Thr Asn Leu Ala Gly
140                 145                 150                 155

gta gga act gct gat ttt gtt ggt gcc aac ttt aca cct cat gta ctg      773
Val Gly Thr Ala Asp Phe Val Gly Ala Asn Phe Thr Pro His Val Leu
                160                 165                 170

atc gtc aac gcc gga gag gat gtg acg atg aag ata atg aca ttc tct      821
Ile Val Asn Ala Gly Glu Asp Val Thr Met Lys Ile Met Thr Phe Ser
            175                 180                 185

caa caa gga tct cgt gct atc tgc atc ctt tca gct aat ggt ccc atc      869
Gln Gln Gly Ser Arg Ala Ile Cys Ile Leu Ser Ala Asn Gly Pro Ile
        190                 195                 200

tcc aat gtt acg ctt cgt caa tct atg aca tcc ggt ggt act cta act      917
Ser Asn Val Thr Leu Arg Gln Ser Met Thr Ser Gly Gly Thr Leu Thr
    205                 210                 215

tat gag ggt cgt ttt gag att ctc tct ttg acg ggt tcg ttt atg caa      965
Tyr Glu Gly Arg Phe Glu Ile Leu Ser Leu Thr Gly Ser Phe Met Gln
220                 225                 230                 235

aat gac tct gga gga act cga agt aga gct ggt ggt atg agt gtt tgc     1013
Asn Asp Ser Gly Gly Thr Arg Ser Arg Ala Gly Gly Met Ser Val Cys
                240                 245                 250

ctt gca gga cca gat ggt cgt gtc ttt ggt gga gga ctc gct ggt ctc     1061
Leu Ala Gly Pro Asp Gly Arg Val Phe Gly Gly Gly Leu Ala Gly Leu
            255                 260                 265

ttt ctt gct gct ggt cct gtc cag gta atg gta ggg act ttt ata gct     1109
Phe Leu Ala Ala Gly Pro Val Gln Val Met Val Gly Thr Phe Ile Ala
        270                 275                 280

ggt caa gag cag tca cag ctg gag cta gca aaa gaa aga cgg cta aga     1157
Gly Gln Glu Gln Ser Gln Leu Glu Leu Ala Lys Glu Arg Arg Leu Arg
    285                 290                 295
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ttt ggg gct caa cca tct tct atc tcc ttt aac ata tcc gca gaa gaa     1205
Phe Gly Ala Gln Pro Ser Ser Ile Ser Phe Asn Ile Ser Ala Glu Glu
300                 305                 310                 315

cgg aag gcg aga ttc gag agg ctt aac aag tct gtt gct att cct gca     1253
Arg Lys Ala Arg Phe Glu Arg Leu Asn Lys Ser Val Ala Ile Pro Ala
                320                 325                 330

cca acc act tca tac acg cat gta aac aca aca aat gcg gtt cac agt     1301
Pro Thr Thr Ser Tyr Thr His Val Asn Thr Thr Asn Ala Val His Ser
            335                 340                 345

tac tat aca aac tcg gtt aac cat gtc aag gat ccc ttc tcg tct atc     1349
Tyr Tyr Thr Asn Ser Val Asn His Val Lys Asp Pro Phe Ser Ser Ile
        350                 355                 360

cca gta gga gga gga gga ggt gga gag gta gga gaa gaa gag ggt gaa     1397
Pro Val Gly Gly Gly Gly Gly Gly Glu Val Gly Glu Glu Glu Gly Glu
    365                 370                 375

gaa gat gat gat gaa tta gaa ggt gaa gac gaa gaa ttc gga ggc gat     1445
Glu Asp Asp Asp Glu Leu Glu Gly Glu Asp Glu Glu Phe Gly Gly Asp
380                 385                 390                 395

agc caa tct gac aac gag att ccg agc tga tgatgatcat acggtttctt      1495
Ser Gln Ser Asp Asn Glu Ile Pro Ser
                400

ttcgcggatt tgttaggttt gatggatttc agattttggt tgattgtttt tattaacaca   1555

gaatgtttag aagctgctat ctttaggttc ccatcctctt gtgattgttg agtatccttg   1615

ttagaaacaa acttactgtt gcaaaactct cttcaaaaaa gtttcacttt gctttccca    1674
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Met Glu Glu Arg Glu Gly Thr Asn Ile Asn Asn Asn Ile Thr Ser Ser
1               5                   10                  15

Phe Gly Leu Lys Gln Gln His Glu Ala Ala Ala Ser Asp Gly Gly Tyr
            20                  25                  30

Ser Met Asp Pro Pro Pro Arg Pro Glu Asn Pro Asn Pro Phe Leu Val
        35                  40                  45

Pro Pro Thr Thr Val Pro Ala Ala Ala Thr Val Ala Ala Ala Val Thr
    50                  55                  60

Glu Asn Ala Ala Thr Pro Phe Ser Leu Thr Met Pro Thr Glu Asn Thr
65                  70                  75                  80
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Ser Ala Glu Gln Leu Lys Lys Lys Arg Gly Arg Pro Arg Lys Tyr Asn
85 90 95

Pro Asp Gly Thr Leu Val Val Thr Leu Ser Pro Met Pro Ile Ser Ser
100 105 110

Ser Val Pro Leu Thr Ser Glu Phe Pro Pro Arg Lys Arg Gly Arg Gly
115 120 125

Arg Gly Lys Ser Asn Arg Trp Leu Lys Lys Ser Gln Met Phe Gln Phe
130 135 140

Asp Arg Ser Pro Val Asp Thr Asn Leu Ala Gly Val Gly Thr Ala Asp
145 150 155 160

Phe Val Gly Ala Asn Phe Thr Pro His Val Leu Ile Val Asn Ala Gly
165 170 175

Glu Asp Val Thr Met Lys Ile Met Thr Phe Ser Gln Gln Gly Ser Arg
180 185 190

Ala Ile Cys Ile Leu Ser Ala Asn Gly Pro Ile Ser Asn Val Thr Leu
195 200 205

Arg Gln Ser Met Thr Ser Gly Gly Thr Leu Thr Tyr Glu Gly Arg Phe
210 215 220

Glu Ile Leu Ser Leu Thr Gly Ser Phe Met Gln Asn Asp Ser Gly Gly
225 230 235 240

Thr Arg Ser Arg Ala Gly Gly Met Ser Val Cys Leu Ala Gly Pro Asp
245 250 255

Gly Arg Val Phe Gly Gly Gly Leu Ala Gly Leu Phe Leu Ala Ala Gly
260 265 270

Pro Val Gln Val Met Val Gly Thr Phe Ile Ala Gly Gln Glu Gln Ser
275 280 285

Gln Leu Glu Leu Ala Lys Glu Arg Arg Leu Arg Phe Gly Ala Gln Pro
290 295 300

Ser Ser Ile Ser Phe Asn Ile Ser Ala Glu Glu Arg Lys Ala Arg Phe

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305                 310                 315                 320

Glu Arg Leu Asn Lys Ser Val Ala Ile Pro Ala Pro Thr Thr Ser Tyr
                325                 330                 335

Thr His Val Asn Thr Thr Asn Ala Val His Ser Tyr Tyr Thr Asn Ser
            340                 345                 350

Val Asn His Val Lys Asp Pro Phe Ser Ser Ile Pro Val Gly Gly Gly
        355                 360                 365

Gly Gly Gly Glu Val Gly Glu Glu Glu Gly Glu Glu Asp Asp Asp Glu
    370                 375                 380

Leu Glu Gly Glu Asp Glu Glu Phe Gly Gly Asp Ser Gln Ser Asp Asn
385                 390                 395                 400

Glu Ile Pro Ser
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<222> (110)..(856) <223> G1411

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gaagaaaagg ctatatttaa aagaaaatca agcaaaagta gatcctcgg atg tat ggg     118
                                                    Met Tyr Gly
                                                    1

aag agg cct ttt gga ggt gat gaa tct gaa gaa agg gaa gaa gat gag       166
Lys Arg Pro Phe Gly Gly Asp Glu Ser Glu Glu Arg Glu Glu Asp Glu
    5                   10                  15

aac ttg ttc ccg gtc ttc tcg gcc cga tct caa cac gac atg cgt gtt       214
Asn Leu Phe Pro Val Phe Ser Ala Arg Ser Gln His Asp Met Arg Val
20                  25                  30                  35

atg gtc tcg gcc ttg act caa gta atc gga aac caa caa agc aaa tct       262
Met Val Ser Ala Leu Thr Gln Val Ile Gly Asn Gln Gln Ser Lys Ser
                40                  45                  50

cat gat aac atc agc tct att gat gat aac tat cct tct gtg tat aat       310
His Asp Asn Ile Ser Ser Ile Asp Asp Asn Tyr Pro Ser Val Tyr Asn
            55                  60                  65

cca caa gac cct aat caa caa gtt gcg cct act cat caa gac caa ggg       358
Pro Gln Asp Pro Asn Gln Gln Val Ala Pro Thr His Gln Asp Gln Gly
        70                  75                  80
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gac ttg agg agg aga cat tat aga ggt gta agg caa agg cca tgg gga      406
Asp Leu Arg Arg Arg His Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly
    85                  90                  95

aag tgg gca gct gaa atc cga gac cca aaa aag gcg gca cgt gtg tgg      454
Lys Trp Ala Ala Glu Ile Arg Asp Pro Lys Lys Ala Ala Arg Val Trp
100                 105                 110                 115

ctc ggg aca ttt gaa acc gct gaa tct gcg gcc tta gct tat gat gaa      502
Leu Gly Thr Phe Glu Thr Ala Glu Ser Ala Ala Leu Ala Tyr Asp Glu
                120                 125                 130

gca gcc cta aag ttc aaa gga agc aaa gca aaa ctc aat ttc ccg gag      550
Ala Ala Leu Lys Phe Lys Gly Ser Lys Ala Lys Leu Asn Phe Pro Glu
            135                 140                 145

agg gtt cag ctt gga agt aac tct aca tat tac tcc tcc aac caa att      598
Arg Val Gln Leu Gly Ser Asn Ser Thr Tyr Tyr Ser Ser Asn Gln Ile
        150                 155                 160

cca caa atg gaa cca caa agt ata ccg aac tat aat caa tac tat cat      646
Pro Gln Met Glu Pro Gln Ser Ile Pro Asn Tyr Asn Gln Tyr Tyr His
    165                 170                 175

gat gcg agt agt ggt gat atg cta agt ttt aat ttg ggc ggt ggg tat      694
Asp Ala Ser Ser Gly Asp Met Leu Ser Phe Asn Leu Gly Gly Gly Tyr
180                 185                 190                 195

ggg agt ggt acc gga tat tca atg tct cat gat aat agt act acg act      742
Gly Ser Gly Thr Gly Tyr Ser Met Ser His Asp Asn Ser Thr Thr Thr
                200                 205                 210

gct gct aca act tct tcg tct tct ggt ggc tct tct agg caa caa gaa      790
Ala Ala Thr Thr Ser Ser Ser Ser Gly Gly Ser Ser Arg Gln Gln Glu
            215                 220                 225

gag caa gat tat gcc aga ttc tgg cgc ttt ggg gat tct tct tcc tct      838
Glu Gln Asp Tyr Ala Arg Phe Trp Arg Phe Gly Asp Ser Ser Ser Ser
        230                 235                 240

cct cat tcg gga tat taa ttaggagatt tgatcagtta cttgtgatga             886
Pro His Ser Gly Tyr
    245

agtaatgata catttcccgt caaaattgag atgatcatat gcttcctgaa tgtttttgag    946

tgtcattttt gtcttccgcg ttaagattta ttgaacgtgt tttcttgttt ttttggttaa   1006

aaaaaaaaaa aaaaaaaaaa aaaaaaaa                                      1034


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Met Tyr Gly Lys Arg Pro Phe Gly Gly Asp Glu Ser Glu Glu Arg Glu
1               5                   10                  15
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Glu Asp Glu Asn Leu Phe Pro Val Phe Ser Ala Arg Ser Gln His Asp
20 25 30

Met Arg Val Met Val Ser Ala Leu Thr Gln Val Ile Gly Asn Gln Gln
35 40 45

Ser Lys Ser His Asp Asn Ile Ser Ser Ile Asp Asp Asn Tyr Pro Ser
50 55 60

Val Tyr Asn Pro Gln Asp Pro Asn Gln Gln Val Ala Pro Thr His Gln
65 70 75 80

Asp Gln Gly Asp Leu Arg Arg Arg His Tyr Arg Gly Val Arg Gln Arg
85 90 95

Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg Asp Pro Lys Lys Ala Ala
100 105 110

Arg Val Trp Leu Gly Thr Phe Glu Thr Ala Glu Ser Ala Ala Leu Ala
115 120 125

Tyr Asp Glu Ala Ala Leu Lys Phe Lys Gly Ser Lys Ala Lys Leu Asn
130 135 140

Phe Pro Glu Arg Val Gln Leu Gly Ser Asn Ser Thr Tyr Tyr Ser Ser
145 150 155 160

Asn Gln Ile Pro Gln Met Glu Pro Gln Ser Ile Pro Asn Tyr Asn Gln
165 170 175

Tyr Tyr His Asp Ala Ser Ser Gly Asp Met Leu Ser Phe Asn Leu Gly
180 185 190

Gly Gly Tyr Gly Ser Gly Thr Gly Tyr Ser Met Ser His Asp Asn Ser
195 200 205

Thr Thr Thr Ala Ala Thr Thr Ser Ser Ser Ser Gly Gly Ser Ser Arg
210 215 220

Gln Gln Glu Glu Gln Asp Tyr Ala Arg Phe Trp Arg Phe Gly Asp Ser
225 230 235 240

Ser Ser Ser Pro His Ser Gly Tyr

245

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<222> (27)..(692) <223> G1419

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Met Ala Ser Ser His Gln Gln Gln Gln
1 5

gaa caa gac cag tca gct tta gat ctc ata acc caa cac ctt ctt act 101
Glu Gln Asp Gln Ser Ala Leu Asp Leu Ile Thr Gln His Leu Leu Thr
10 15 20 25

gat ttc cct tcc tta gac acc ttt gcc tcc acc atc cac cac tgc acc 149
Asp Phe Pro Ser Leu Asp Thr Phe Ala Ser Thr Ile His His Cys Thr
30 35 40

acc tca act cta agc caa cgc aaa cca cct ctt gcc act ata gca gtt 197
Thr Ser Thr Leu Ser Gln Arg Lys Pro Pro Leu Ala Thr Ile Ala Val
45 50 55

cct act act gca ccg gtg gtt caa gag aat gat caa agg cat tac aga 245
Pro Thr Thr Ala Pro Val Val Gln Glu Asn Asp Gln Arg His Tyr Arg
60 65 70

ggc gtc agg aga aga cca tgg ggt aag tat gcg gct gag atc aga gac 293
Gly Val Arg Arg Arg Pro Trp Gly Lys Tyr Ala Ala Glu Ile Arg Asp
75 80 85

cca aac aag aaa ggt gtt cgt gtc tgg tta ggc act ttt gac aca gcc 341
Pro Asn Lys Lys Gly Val Arg Val Trp Leu Gly Thr Phe Asp Thr Ala
90 95 100 105

atg gaa gct gca aga ggt tat gac aag gca gct ttt aaa cta cga gga 389
Met Glu Ala Ala Arg Gly Tyr Asp Lys Ala Ala Phe Lys Leu Arg Gly
110 115 120

agc aaa gct att ctt aac ttc cca ctt gaa gca gga aag cat gag gac 437
Ser Lys Ala Ile Leu Asn Phe Pro Leu Glu Ala Gly Lys His Glu Asp
125 130 135

ttg gga gac aac aag aag act att tct tta aaa gca aag agg aag aga 485
Leu Gly Asp Asn Lys Lys Thr Ile Ser Leu Lys Ala Lys Arg Lys Arg
140 145 150

cag gtg acg gag gat gaa agc cag ctg atc agc cgt aaa gct gtt aag 533
Gln Val Thr Glu Asp Glu Ser Gln Leu Ile Ser Arg Lys Ala Val Lys
155 160 165

agg gaa gaa gct cag gtt cag gct gat gct tgt cca tta acg cca tca 581
Arg Glu Glu Ala Gln Val Gln Ala Asp Ala Cys Pro Leu Thr Pro Ser
170 175 180 185

agt tgg aag ggg ttt tgg gac gga gca gac agt aaa gac atg gga ata 629
Ser Trp Lys Gly Phe Trp Asp Gly Ala Asp Ser Lys Asp Met Gly Ile

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                190                 195                 200

ttt tcc gtg cct ctg tta tct cct tgt cca tct ctt gga cac tct caa      677
Phe Ser Val Pro Leu Leu Ser Pro Cys Pro Ser Leu Gly His Ser Gln
            205                 210                 215

ctc gta gtt act taa gcttcagagg gtcaaactgg aaaaaatcaa cattggattg      732
Leu Val Val Thr
        220

ttttcaaagc ttctagatta gctgattgta aaaaaatgtt ttactatatt cattcattct    792

tcttaaatgc aattctttct acccttcc                                       820


<210>  216 <211>  221 <212>  PRT <213>  Arabidopsis thaliana  <400>  216

Met Ala Ser Ser His Gln Gln Gln Glu Gln Asp Gln Ser Ala Leu
1               5                   10                  15


Asp Leu Ile Thr Gln His Leu Leu Thr Asp Phe Pro Ser Leu Asp Thr
            20                  25                  30


Phe Ala Ser Thr Ile His His Cys Thr Thr Ser Thr Leu Ser Gln Arg
        35                  40                  45


Lys Pro Pro Leu Ala Thr Ile Ala Val Pro Thr Thr Ala Pro Val Val
    50                  55                  60


Gln Glu Asn Asp Gln Arg His Tyr Arg Gly Val Arg Arg Arg Pro Trp
65                  70                  75                  80


Gly Lys Tyr Ala Ala Glu Ile Arg Asp Pro Asn Lys Lys Gly Val Arg
                85                  90                  95


Val Trp Leu Gly Thr Phe Asp Thr Ala Met Glu Ala Ala Arg Gly Tyr
            100                 105                 110


Asp Lys Ala Ala Phe Lys Leu Arg Gly Ser Lys Ala Ile Leu Asn Phe
        115                 120                 125


Pro Leu Glu Ala Gly Lys His Glu Asp Leu Gly Asp Asn Lys Lys Thr
    130                 135                 140


Ile Ser Leu Lys Ala Lys Arg Lys Arg Gln Val Thr Glu Asp Glu Ser
145                 150                 155                 160
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Gln Leu Ile Ser Arg Lys Ala Val Lys Arg Glu Glu Ala Gln Val Gln
                165                 170                 175

Ala Asp Ala Cys Pro Leu Thr Pro Ser Ser Trp Lys Gly Phe Trp Asp
            180                 185                 190

Gly Ala Asp Ser Lys Asp Met Gly Ile Phe Ser Val Pro Leu Leu Ser
        195                 200                 205

Pro Cys Pro Ser Leu Gly His Ser Gln Leu Val Val Thr
    210                 215                 220
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ctcttgattc cataagcata tattaaaaaa gctctctgct ttcttcaact ttcccgggaa    120

aatcttcttg ttacaaagca tcaatctctt gttttaccaa ttttctctct ttattccttt    180

tttgcccttt acttttccta actttggtct ttatatataa acacacgaca caaagaagaa    240

cacacataag ttaaaactat tacaacagtt ttaaagagag agatttaaaa a atg gag     297
                                                          Met Glu
                                                          1

aca gag aag aaa gtt tct ctc cca aga atc tta cga atc tct gtt act      345
Thr Glu Lys Lys Val Ser Leu Pro Arg Ile Leu Arg Ile Ser Val Thr
        5                   10                  15

gat cct tac gca aca gat tcg tca agc gac gaa gaa gaa gaa gtt gat      393
Asp Pro Tyr Ala Thr Asp Ser Ser Ser Asp Glu Glu Glu Glu Val Asp
    20                  25                  30

ttt gat gca tta tct aca aaa cga cgt cgt gtt aag aag tac gtg aag      441
Phe Asp Ala Leu Ser Thr Lys Arg Arg Arg Val Lys Lys Tyr Val Lys
35                  40                  45                  50

gaa gtg gtg ctt gat tcg gtg gtt tct gat aaa gag aag ccg atg aag      489
Glu Val Val Leu Asp Ser Val Val Ser Asp Lys Glu Lys Pro Met Lys
                55                  60                  65

aag aag aga aag aag cgc gtt gtt act gtt cca gtg gtt gtt acg acg      537
Lys Lys Arg Lys Lys Arg Val Val Thr Val Pro Val Val Val Thr Thr
            70                  75                  80

gcg acg agg aag ttt cgt gga gtg agg caa aga ccg tgg gga aaa tgg      585
Ala Thr Arg Lys Phe Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Trp
        85                  90                  95

gcg gcg gag att aga gat ccg agt aga cgt gtt agg gtt tgg tta ggt      633
```

```
Ala Ala Glu Ile Arg Asp Pro Ser Arg Arg Val Arg Val Trp Leu Gly
    100                 105                 110

act ttt gac acg gcg gag gaa gct gcc att gtt tac gat aac gca gct      681
Thr Phe Asp Thr Ala Glu Glu Ala Ala Ile Val Tyr Asp Asn Ala Ala
115                 120                 125                 130

att cag cta cgt ggt cct aac gca gag ctt aac ttc cct cct cct ccg      729
Ile Gln Leu Arg Gly Pro Asn Ala Glu Leu Asn Phe Pro Pro Pro Pro
                135                 140                 145

gtg acg gag aat gtt gaa gaa gct tcg acg gag gtg aaa gga gtt tcg      777
Val Thr Glu Asn Val Glu Glu Ala Ser Thr Glu Val Lys Gly Val Ser
            150                 155                 160

gat ttt atc att ggc ggt gga gaa tgt ctt cgt tcg ccg gtt tct gtt      825
Asp Phe Ile Ile Gly Gly Gly Glu Cys Leu Arg Ser Pro Val Ser Val
        165                 170                 175

ctc gaa tct ccg ttc tcc ggc gag tct act gcg gtt aaa gag gag ttt      873
Leu Glu Ser Pro Phe Ser Gly Glu Ser Thr Ala Val Lys Glu Glu Phe
    180                 185                 190

gtc ggt gta tcg acg gcg gag att gtg gtt aaa aag gag ccg tct ttt      921
Val Gly Val Ser Thr Ala Glu Ile Val Val Lys Lys Glu Pro Ser Phe
195                 200                 205                 210

aac ggt tca gat ttc tcg gcg ccg ttg ttc tcg gac gac gac gtt ttt      969
Asn Gly Ser Asp Phe Ser Ala Pro Leu Phe Ser Asp Asp Asp Val Phe
                215                 220                 225

ggt ttc tcg acg tcg atg agt gaa agt ttc ggc ggc gat tta ttt gga     1017
Gly Phe Ser Thr Ser Met Ser Glu Ser Phe Gly Gly Asp Leu Phe Gly
            230                 235                 240

gat aat ctt ttt gcg gat atg agt ttt gga tcc ggg ttt gga ttc ggg     1065
Asp Asn Leu Phe Ala Asp Met Ser Phe Gly Ser Gly Phe Gly Phe Gly
        245                 250                 255

tct ggg tct gga ttc tcc agc tgg cac gtt gag gac cat ttt caa gat     1113
Ser Gly Ser Gly Phe Ser Ser Trp His Val Glu Asp His Phe Gln Asp
    260                 265                 270

att ggg gat tta ttc ggg tcg gat cct gtc tta act gtt taa             1155
Ile Gly Asp Leu Phe Gly Ser Asp Pro Val Leu Thr Val
275                 280                 285

gaaataactg gccgtttaac ggcgtttagt gaagttttgt taccggcgac ggcgaggatt   1215

aaaaaaaaac ggcgatttat tttttgaatg aagatttgtt aaata                   1260


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Met Glu Thr Glu Lys Lys Val Ser Leu Pro Arg Ile Leu Arg Ile Ser
1               5                   10                  15
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Val Thr Asp Pro Tyr Ala Thr Asp Ser Ser Ser Asp Glu Glu Glu Glu
            20                  25                  30

Val Asp Phe Asp Ala Leu Ser Thr Lys Arg Arg Arg Val Lys Lys Tyr
        35                  40                  45

Val Lys Glu Val Val Leu Asp Ser Val Val Ser Asp Lys Glu Lys Pro
    50                  55                  60

Met Lys Lys Lys Arg Lys Lys Arg Val Val Thr Val Pro Val Val Val
65                  70                  75                  80

Thr Thr Ala Thr Arg Lys Phe Arg Gly Val Arg Gln Arg Pro Trp Gly
                85                  90                  95

Lys Trp Ala Ala Glu Ile Arg Asp Pro Ser Arg Arg Val Arg Val Trp
            100                 105                 110

Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala Ala Ile Val Tyr Asp Asn
        115                 120                 125

Ala Ala Ile Gln Leu Arg Gly Pro Asn Ala Glu Leu Asn Phe Pro Pro
    130                 135                 140

Pro Pro Val Thr Glu Asn Val Glu Glu Ala Ser Thr Glu Val Lys Gly
145                 150                 155                 160

Val Ser Asp Phe Ile Ile Gly Gly Gly Glu Cys Leu Arg Ser Pro Val
                165                 170                 175

Ser Val Leu Glu Ser Pro Phe Ser Gly Glu Ser Thr Ala Val Lys Glu
            180                 185                 190

Glu Phe Val Gly Val Ser Thr Ala Glu Ile Val Val Lys Lys Glu Pro
        195                 200                 205

Ser Phe Asn Gly Ser Asp Phe Ser Ala Pro Leu Phe Ser Asp Asp Asp
    210                 215                 220

Val Phe Gly Phe Ser Thr Ser Met Ser Glu Ser Phe Gly Gly Asp Leu
225                 230                 235                 240
```

```
Phe Gly Asp Asn Leu Phe Ala Asp Met Ser Phe Gly Ser Gly Phe Gly
                245                 250                 255

Phe Gly Ser Gly Ser Gly Phe Ser Ser Trp His Val Glu Asp His Phe
            260                 265                 270

Gln Asp Ile Gly Asp Leu Phe Gly Ser Asp Pro Val Leu Thr Val
        275                 280                 285
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<222> (8)..(904) <223> G1435

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        Met Gly Lys Glu Val Met Val Ser Asp Tyr Gly Asp Asp Asp
        1               5                   10

gga gaa gac gcc ggc ggc ggc gat gaa tat agg att ccg gaa tgg gaa       97
Gly Glu Asp Ala Gly Gly Gly Asp Glu Tyr Arg Ile Pro Glu Trp Glu
15                  20                  25                  30

att ggt tta ccc aac gga gat gat ttg act ccg tta tct caa tat cta      145
Ile Gly Leu Pro Asn Gly Asp Asp Leu Thr Pro Leu Ser Gln Tyr Leu
                35                  40                  45

gtc ccg tcg att ctc gcg tta gct ttc agc atg atc cca gaa cga agc      193
Val Pro Ser Ile Leu Ala Leu Ala Phe Ser Met Ile Pro Glu Arg Ser
            50                  55                  60

cgt aca att cac gac gtc aat cgc gcg tcg caa atc acg ctc tct tcg      241
Arg Thr Ile His Asp Val Asn Arg Ala Ser Gln Ile Thr Leu Ser Ser
        65                  70                  75

ttg aga agc agt acc aat gct tcg tct gtg atg gag gag gtc gtg gat      289
Leu Arg Ser Ser Thr Asn Ala Ser Ser Val Met Glu Glu Val Val Asp
    80                  85                  90

cga gtt gaa tcg agt gtt cca gga tca gat ccg aag aaa cag aag aaa      337
Arg Val Glu Ser Ser Val Pro Gly Ser Asp Pro Lys Lys Gln Lys Lys
95                  100                 105                 110

tcg gat ggt ggt gaa gca gcg gcg gtg gag gat tcc acg gcg gag gaa      385
Ser Asp Gly Gly Glu Ala Ala Ala Val Glu Asp Ser Thr Ala Glu Glu
                115                 120                 125

gga gac tcc ggg cct gaa gac gcg tct ggg aag aca tcg aaa cga ccg      433
Gly Asp Ser Gly Pro Glu Asp Ala Ser Gly Lys Thr Ser Lys Arg Pro
            130                 135                 140

cgt tta gtg tgg aca ccg cag cta cac aag aga ttt gtg gac gtt gtg      481
Arg Leu Val Trp Thr Pro Gln Leu His Lys Arg Phe Val Asp Val Val
        145                 150                 155

gct cat cta ggg att aaa aac gca gtg ccg aag acg att atg cag ctg      529
```

```
Ala His Leu Gly Ile Lys Asn Ala Val Pro Lys Thr Ile Met Gln Leu
    160                 165                 170

atg aac gtg gaa gga ctt act cgt gag aac gtt gcg tct cat ttg cag      577
Met Asn Val Glu Gly Leu Thr Arg Glu Asn Val Ala Ser His Leu Gln
175                 180                 185                 190

aaa tat agg ctt tac ctt aaa cgg att caa gga ttg acg acg gaa gaa      625
Lys Tyr Arg Leu Tyr Leu Lys Arg Ile Gln Gly Leu Thr Thr Glu Glu
                195                 200                 205

gat cct tat tcg tcg tcg gat cag ctc ttc tct tca acg ccg gtt cct      673
Asp Pro Tyr Ser Ser Ser Asp Gln Leu Phe Ser Ser Thr Pro Val Pro
            210                 215                 220

cca cag agc ttt caa gac ggc gga gga agt aac gga aag ttg ggg gtt      721
Pro Gln Ser Phe Gln Asp Gly Gly Gly Ser Asn Gly Lys Leu Gly Val
        225                 230                 235

ccg gtt ccg gtt ccg tcg atg gtg cct att cca ggc tat ggg aat caa      769
Pro Val Pro Val Pro Ser Met Val Pro Ile Pro Gly Tyr Gly Asn Gln
    240                 245                 250

atg ggt atg caa gga tat tat caa cag tat agt aac cat ggc aat gaa      817
Met Gly Met Gln Gly Tyr Tyr Gln Gln Tyr Ser Asn His Gly Asn Glu
255                 260                 265                 270

tca aac caa tat atg atg cag cag aat aag ttt gga aca atg gtg aca      865
Ser Asn Gln Tyr Met Met Gln Gln Asn Lys Phe Gly Thr Met Val Thr
                275                 280                 285

tat cct tct gtt ggt ggt ggt gac gtg aat gac aag taa atggatctta       914
Tyr Pro Ser Val Gly Gly Gly Asp Val Asn Asp Lys
            290                 295

aaggtctata atttgctcta cagagagata ctggttcttg gcttatggtt tattttccca    974

cttcatgagg ttgttgtgac ttttaattct ccatgttttc cacacaagtc tttattgcct   1034

ttgtatagaa aatgatttcg agaaaatcac tgggaagctt ggtattgttg gaggatgaag   1094

ccttctatga atgatttagt ttcctactgt ctccattctt tatgaggtaa taaagccttc   1154

ttttgctcat cgcttgtagt cttcttaaat tcaagacagc gtcacatgtt tgttcggtta   1214

tgttaattgt ttctttcttt ggataatgaa gatagcatca ggtctcatgt ctcctcactt   1274

tgataaa                                                             1281

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Met Gly Lys Glu Val Met Val Ser Asp Tyr Gly Asp Asp Asp Gly Glu
1               5                   10                  15

Asp Ala Gly Gly Gly Asp Glu Tyr Arg Ile Pro Glu Trp Glu Ile Gly
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            20                  25                  30

Leu Pro Asn Gly Asp Asp Leu Thr Pro Leu Ser Gln Tyr Leu Val Pro
        35                  40                  45

Ser Ile Leu Ala Leu Ala Phe Ser Met Ile Pro Glu Arg Ser Arg Thr
    50                  55                  60

Ile His Asp Val Asn Arg Ala Ser Gln Ile Thr Leu Ser Ser Leu Arg
65                  70                  75                  80

Ser Ser Thr Asn Ala Ser Ser Val Met Glu Glu Val Val Asp Arg Val
                85                  90                  95

Glu Ser Ser Val Pro Gly Ser Asp Pro Lys Lys Gln Lys Lys Ser Asp
            100                 105                 110

Gly Gly Glu Ala Ala Ala Val Glu Asp Ser Thr Ala Glu Glu Gly Asp
        115                 120                 125

Ser Gly Pro Glu Asp Ala Ser Gly Lys Thr Ser Lys Arg Pro Arg Leu
    130                 135                 140

Val Trp Thr Pro Gln Leu His Lys Arg Phe Val Asp Val Val Ala His
145                 150                 155                 160

Leu Gly Ile Lys Asn Ala Val Pro Lys Thr Ile Met Gln Leu Met Asn
                165                 170                 175

Val Glu Gly Leu Thr Arg Glu Asn Val Ala Ser His Leu Gln Lys Tyr
            180                 185                 190

Arg Leu Tyr Leu Lys Arg Ile Gln Gly Leu Thr Thr Glu Glu Asp Pro
        195                 200                 205

Tyr Ser Ser Ser Asp Gln Leu Phe Ser Ser Thr Pro Val Pro Pro Gln
    210                 215                 220

Ser Phe Gln Asp Gly Gly Gly Ser Asn Gly Lys Leu Gly Val Pro Val
225                 230                 235                 240

Pro Val Pro Ser Met Val Pro Ile Pro Gly Tyr Gly Asn Gln Met Gly
                245                 250                 255
```

```
Met Gln Gly Tyr Tyr Gln Gln Tyr Ser Asn His Gly Asn Glu Ser Asn
            260                 265                 270

Gln Tyr Met Met Gln Gln Asn Lys Phe Gly Thr Met Val Thr Tyr Pro
        275                 280                 285

Ser Val Gly Gly Gly Asp Val Asn Asp Lys
    290                 295
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<222> (105)..(581) <223> G1449

<400> 221

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agaaggaagc atgaagctag ctctgcagct tcaaggtctc atta atg gag gtc tct     116
                                                 Met Glu Val Ser
                                                 1

aac tct tgt tct tca ttt tct tca tcc tct gtc gac agt act aaa cct      164
Asn Ser Cys Ser Ser Phe Ser Ser Ser Ser Val Asp Ser Thr Lys Pro
5                   10                  15                  20

tct cct tct gaa tct tct gtt aat ctc tcc ctt agt ctc aca ttt cct      212
Ser Pro Ser Glu Ser Ser Val Asn Leu Ser Leu Ser Leu Thr Phe Pro
                25                  30                  35

tct act tct cca caa aga gaa gca aga caa gat tgg cca ccg ata aag      260
Ser Thr Ser Pro Gln Arg Glu Ala Arg Gln Asp Trp Pro Pro Ile Lys
            40                  45                  50

tct aga tta aga gat aca cta aag ggt cgt cgt ctt ctt cgt cgt ggt      308
Ser Arg Leu Arg Asp Thr Leu Lys Gly Arg Arg Leu Leu Arg Arg Gly
        55                  60                  65

gat gac act tct ctc ttt gtt aag gtt tat atg gaa ggt gtt ccc att      356
Asp Asp Thr Ser Leu Phe Val Lys Val Tyr Met Glu Gly Val Pro Ile
    70                  75                  80

gga aga aaa ctc gac ctt tgc gta ttc tca ggc tac gag agt cta tta      404
Gly Arg Lys Leu Asp Leu Cys Val Phe Ser Gly Tyr Glu Ser Leu Leu
85                  90                  95                  100

gaa aat ctc tct cac atg ttc gat act tca atc atc tgc ggt aat cga      452
Glu Asn Leu Ser His Met Phe Asp Thr Ser Ile Ile Cys Gly Asn Arg
                105                 110                 115

gat cga aaa cat cat gtt ttg aca tat gaa gac aag gat gga gat tgg      500
Asp Arg Lys His His Val Leu Thr Tyr Glu Asp Lys Asp Gly Asp Trp
            120                 125                 130

atg atg gtc gga gat att cca tgg gat atg ttt ctt gaa acc gtg aga      548
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Met Met Val Gly Asp Ile Pro Trp Asp Met Phe Leu Glu Thr Val Arg
135 140 145

aga cta aag atc acg aga ccg gag agg tat taa aacttggatc ggtcaaggct 601
Arg Leu Lys Ile Thr Arg Pro Glu Arg Tyr
150 155

gtgattgcgc agttacgaga cgtgtaagat ttaggcattg atgaagagac ttgaggcggg 661

acggagctat tgctgcatat tgcaacaaag gccttgaaga agttggagaa ttgattgatg 721

catatattta tttatatgac acctttgagt gtgtttttc ttataaataa atcacaatat 781

ccaagacttc tctttaaa 799

<210> 222 <211> 158 <212> PRT <213> Arabidopsis thaliana <400> 222

Met Glu Val Ser Asn Ser Cys Ser Ser Phe Ser Ser Ser Ser Val Asp
1 5 10 15

Ser Thr Lys Pro Ser Pro Ser Glu Ser Ser Val Asn Leu Ser Leu Ser
20 25 30

Leu Thr Phe Pro Ser Thr Ser Pro Gln Arg Glu Ala Arg Gln Asp Trp
35 40 45

Pro Pro Ile Lys Ser Arg Leu Arg Asp Thr Leu Lys Gly Arg Arg Leu
50 55 60

Leu Arg Arg Gly Asp Asp Thr Ser Leu Phe Val Lys Val Tyr Met Glu
65 70 75 80

Gly Val Pro Ile Gly Arg Lys Leu Asp Leu Cys Val Phe Ser Gly Tyr
85 90 95

Glu Ser Leu Leu Glu Asn Leu Ser His Met Phe Asp Thr Ser Ile Ile
100 105 110

Cys Gly Asn Arg Asp Arg Lys His His Val Leu Thr Tyr Glu Asp Lys
115 120 125

Asp Gly Asp Trp Met Met Val Gly Asp Ile Pro Trp Asp Met Phe Leu
130 135 140

Glu Thr Val Arg Arg Leu Lys Ile Thr Arg Pro Glu Arg Tyr
145 150 155

<210> 223 <211> 1424 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (114)..(1406) <223> G1494

<400> 223
tcgacagagt tgtgttgggc gtggaacttg gactagttcc acatatcagg ttatatagat 60

cttctctttc aacttctgat tcgtccagaa gctttcctaa tctgagatct gac atg 116
Met
1

gaa cac caa ggt tgg agt ttt gag gag aat tat agt ttg tcc act aat 164
Glu His Gln Gly Trp Ser Phe Glu Glu Asn Tyr Ser Leu Ser Thr Asn
5 10 15

aga aga tct atc agg cca caa gat gaa cta gtg gag tta tta tgg cga 212
Arg Arg Ser Ile Arg Pro Gln Asp Glu Leu Val Glu Leu Leu Trp Arg
20 25 30

gat gga caa gtg gtt ctg cag agc caa act cat aga gaa caa acc caa 260
Asp Gly Gln Val Val Leu Gln Ser Gln Thr His Arg Glu Gln Thr Gln
35 40 45

acc cag aaa caa gat cat cat gaa gaa gcc cta aga tcc agc acc ttt 308
Thr Gln Lys Gln Asp His His Glu Glu Ala Leu Arg Ser Ser Thr Phe
50 55 60 65

ctt gaa gat caa gaa act gtc tct tgg atc caa tac cct cca gat gaa 356
Leu Glu Asp Gln Glu Thr Val Ser Trp Ile Gln Tyr Pro Pro Asp Glu
70 75 80

gac cca ttc gaa ccc gac gac ttc tcc tcc cac ttc ttc tca acc atg 404
Asp Pro Phe Glu Pro Asp Asp Phe Ser Ser His Phe Phe Ser Thr Met
85 90 95

gat ccc ctc cag aga cca acc tca gag acg gtt aag cct aag tcc agt 452
Asp Pro Leu Gln Arg Pro Thr Ser Glu Thr Val Lys Pro Lys Ser Ser
100 105 110

cct gaa cct cct caa gtc atg gtt aag cct aag gcc tgt cct gac cct 500
Pro Glu Pro Pro Gln Val Met Val Lys Pro Lys Ala Cys Pro Asp Pro
115 120 125

cct cct caa gtc atg cct cct cca aaa ttt agg tta aca aat tca tca 548
Pro Pro Gln Val Met Pro Pro Pro Lys Phe Arg Leu Thr Asn Ser Ser
130 135 140 145

tcg ggg att agg gaa aca gaa atg gaa cag tac tcg gta acg acc gtt 596
Ser Gly Ile Arg Glu Thr Glu Met Glu Gln Tyr Ser Val Thr Thr Val
150 155 160

gga cct agc cat tgc gga agc aac cca tca cag aac gat ctc gat gtc 644
Gly Pro Ser His Cys Gly Ser Asn Pro Ser Gln Asn Asp Leu Asp Val
165 170 175

tca atg agt cat gat cga agc aaa aac ata gaa gaa aag ctt aat ccg 692
Ser Met Ser His Asp Arg Ser Lys Asn Ile Glu Glu Lys Leu Asn Pro

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        180                 185                 190

aac gca agt tcc tca tca ggt ggc tcc tct ggt tgc agc ttt ggc aaa      740
Asn Ala Ser Ser Ser Ser Gly Gly Ser Ser Gly Cys Ser Phe Gly Lys
    195                 200                 205

gat atc aaa gaa atg gct agt gga aga tgc atc aca acc gac cgt aag      788
Asp Ile Lys Glu Met Ala Ser Gly Arg Cys Ile Thr Thr Asp Arg Lys
210                 215                 220                 225

aga aaa cgt ata aat cac act gac gaa tct gta tct cta tca gat gca      836
Arg Lys Arg Ile Asn His Thr Asp Glu Ser Val Ser Leu Ser Asp Ala
                230                 235                 240

atc ggt aac aag tcg aac caa cga tca gga tca aac cga agg agt cga      884
Ile Gly Asn Lys Ser Asn Gln Arg Ser Gly Ser Asn Arg Arg Ser Arg
            245                 250                 255

gca gct gaa gtt cat aat ctc tcc gaa agg agg agg aga gat agg atc      932
Ala Ala Glu Val His Asn Leu Ser Glu Arg Arg Arg Arg Asp Arg Ile
        260                 265                 270

aat gag aga atg aag gct ttg caa gaa cta ata cct cac tgc agt aaa      980
Asn Glu Arg Met Lys Ala Leu Gln Glu Leu Ile Pro His Cys Ser Lys
    275                 280                 285

act gat aaa gct tcg att tta gac gaa gcc ata gat tat ttg aaa tca     1028
Thr Asp Lys Ala Ser Ile Leu Asp Glu Ala Ile Asp Tyr Leu Lys Ser
290                 295                 300                 305

ctt cag tta cag ctt caa gtg atg tgg atg ggg agt gga atg gcg gcg     1076
Leu Gln Leu Gln Leu Gln Val Met Trp Met Gly Ser Gly Met Ala Ala
                310                 315                 320

gcg gcg gct tcg gct ccg atg atg ttc ccc gga gtt caa cct cag cag     1124
Ala Ala Ala Ser Ala Pro Met Met Phe Pro Gly Val Gln Pro Gln Gln
            325                 330                 335

ttc ata cgt cag ata cag agc ccg gta cag tta cct cga ttt ccg gtt     1172
Phe Ile Arg Gln Ile Gln Ser Pro Val Gln Leu Pro Arg Phe Pro Val
        340                 345                 350

atg gat cag tct gca att cag aac aat ccc ggt tta gtt tgc caa aac     1220
Met Asp Gln Ser Ala Ile Gln Asn Asn Pro Gly Leu Val Cys Gln Asn
    355                 360                 365

ccg gta caa aac cag atc atc tcc gac cgg ttt gct aga tac atc ggt     1268
Pro Val Gln Asn Gln Ile Ile Ser Asp Arg Phe Ala Arg Tyr Ile Gly
370                 375                 380                 385

ggg ttc cca cac atg cag gcc gcg act cag atg cag ccg atg gag atg     1316
Gly Phe Pro His Met Gln Ala Ala Thr Gln Met Gln Pro Met Glu Met
                390                 395                 400

ttg aga ttt agt tca ccg gcg gga cag caa agt caa caa ccg tcg tct     1364
Leu Arg Phe Ser Ser Pro Ala Gly Gln Gln Ser Gln Gln Pro Ser Ser
            405                 410                 415
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gtg ccg acg aag acc acc gac ggt tct cgt ttg gac cac tag 1406
Val Pro Thr Lys Thr Thr Asp Gly Ser Arg Leu Asp His
420 425 430

gttggtgagc cactttgc 1424

<210> 224 <211> 430 <212> PRT <213> Arabidopsis thaliana <400> 224

Met Glu His Gln Gly Trp Ser Phe Glu Glu Asn Tyr Ser Leu Ser Thr
1 5 10 15

Asn Arg Arg Ser Ile Arg Pro Gln Asp Glu Leu Val Glu Leu Leu Trp
20 25 30

Arg Asp Gly Gln Val Val Leu Gln Ser Gln Thr His Arg Glu Gln Thr
35 40 45

Gln Thr Gln Lys Gln Asp His His Glu Glu Ala Leu Arg Ser Ser Thr
50 55 60

Phe Leu Glu Asp Gln Glu Thr Val Ser Trp Ile Gln Tyr Pro Pro Asp
65 70 75 80

Glu Asp Pro Phe Glu Pro Asp Asp Phe Ser Ser His Phe Phe Ser Thr
85 90 95

Met Asp Pro Leu Gln Arg Pro Thr Ser Glu Thr Val Lys Pro Lys Ser
100 105 110

Ser Pro Glu Pro Pro Gln Val Met Val Lys Pro Lys Ala Cys Pro Asp
115 120 125

Pro Pro Pro Gln Val Met Pro Pro Pro Lys Phe Arg Leu Thr Asn Ser
130 135 140

Ser Ser Gly Ile Arg Glu Thr Glu Met Glu Gln Tyr Ser Val Thr Thr
145 150 155 160

Val Gly Pro Ser His Cys Gly Ser Asn Pro Ser Gln Asn Asp Leu Asp
165 170 175

Val Ser Met Ser His Asp Arg Ser Lys Asn Ile Glu Glu Lys Leu Asn
180 185 190

Pro Asn Ala Ser Ser Ser Ser Gly Gly Ser Ser Gly Cys Ser Phe Gly
195 200 205

Lys Asp Ile Lys Glu Met Ala Ser Gly Arg Cys Ile Thr Thr Asp Arg
210 215 220

Lys Arg Lys Arg Ile Asn His Thr Asp Glu Ser Val Ser Leu Ser Asp
225 230 235 240

Ala Ile Gly Asn Lys Ser Asn Gln Arg Ser Gly Ser Asn Arg Arg Ser
245 250 255

Arg Ala Ala Glu Val His Asn Leu Ser Glu Arg Arg Arg Arg Asp Arg
260 265 270

Ile Asn Glu Arg Met Lys Ala Leu Gln Glu Leu Ile Pro His Cys Ser
275 280 285

Lys Thr Asp Lys Ala Ser Ile Leu Asp Glu Ala Ile Asp Tyr Leu Lys
290 295 300

Ser Leu Gln Leu Gln Leu Gln Val Met Trp Met Gly Ser Gly Met Ala
305 310 315 320

Ala Ala Ala Ala Ser Ala Pro Met Met Phe Pro Gly Val Gln Pro Gln
325 330 335

Gln Phe Ile Arg Gln Ile Gln Ser Pro Val Gln Leu Pro Arg Phe Pro
340 345 350

Val Met Asp Gln Ser Ala Ile Gln Asn Asn Pro Gly Leu Val Cys Gln
355 360 365

Asn Pro Val Gln Asn Gln Ile Ile Ser Asp Arg Phe Ala Arg Tyr Ile
370 375 380

Gly Gly Phe Pro His Met Gln Ala Ala Thr Gln Met Gln Pro Met Glu
385 390 395 400

Met Leu Arg Phe Ser Ser Pro Ala Gly Gln Gln Ser Gln Gln Pro Ser
405 410 415

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Ser Val Pro Thr Lys Thr Thr Asp Gly Ser Arg Leu Asp His
            420                 425                 430


<210>  225 <211>  1306 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (116)..(1123) <223>  G1496

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acttttggtc tcactttaaa agatcataag ttgaaagatt tctgcagaga acaat atg     118
                                                            Met
                                                             1

ttg gaa ggt ctt gtc tct caa gaa agc ttg tcc tta aac tct atg gac      166
Leu Glu Gly Leu Val Ser Gln Glu Ser Leu Ser Leu Asn Ser Met Asp
            5                   10                  15

atg tct gta ctt gaa agg ctt aaa tgg gta caa cag caa caa cag caa      214
Met Ser Val Leu Glu Arg Leu Lys Trp Val Gln Gln Gln Gln Gln Gln
        20                  25                  30

ctg caa caa gtt gtg tcc cat agc agt aat aat tca cct gaa ctt ctt      262
Leu Gln Gln Val Val Ser His Ser Ser Asn Asn Ser Pro Glu Leu Leu
    35                  40                  45

cag ata ctt cag ttc cat gga agc aac aat gat gag ttg ttg gag agt      310
Gln Ile Leu Gln Phe His Gly Ser Asn Asn Asp Glu Leu Leu Glu Ser
50                  55                  60                  65

agt ttc agc caa ttt caa atg ctt gga tct ggt ttt gga cca aac tat      358
Ser Phe Ser Gln Phe Gln Met Leu Gly Ser Gly Phe Gly Pro Asn Tyr
                70                  75                  80

aac atg ggt ttt ggt cct cca cat gaa tcc att tca aga aca agt agc      406
Asn Met Gly Phe Gly Pro Pro His Glu Ser Ile Ser Arg Thr Ser Ser
            85                  90                  95

tgc cat atg gaa cct gtg gat aca atg gag gtt ttg ttg aag acc ggt      454
Cys His Met Glu Pro Val Asp Thr Met Glu Val Leu Leu Lys Thr Gly
        100                 105                 110

gaa gaa acc aga gcc gtt gcc ttg aag aac aag aga aaa cca gag gtt      502
Glu Glu Thr Arg Ala Val Ala Leu Lys Asn Lys Arg Lys Pro Glu Val
    115                 120                 125

aag aca agg gaa gag caa aag aca gag aag aag atc aaa gta gag gct      550
Lys Thr Arg Glu Glu Gln Lys Thr Glu Lys Lys Ile Lys Val Glu Ala
130                 135                 140                 145

gag aca gag tca agc atg aaa gga aaa tca aac atg gga aac act gaa      598
Glu Thr Glu Ser Ser Met Lys Gly Lys Ser Asn Met Gly Asn Thr Glu
                150                 155                 160

gca tct tca gac act tca aag gag aca tcg aaa gga gct tca gag aat      646
Ala Ser Ser Asp Thr Ser Lys Glu Thr Ser Lys Gly Ala Ser Glu Asn
            165                 170                 175
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cag aaa tta gat tat atc cac gtg aga gct cgt cga ggc caa gcc act 694
Gln Lys Leu Asp Tyr Ile His Val Arg Ala Arg Arg Gly Gln Ala Thr
180 185 190

gac aga cac agc tta gca gaa agg gcg aga aga gaa aag atc agc aag 742
Asp Arg His Ser Leu Ala Glu Arg Ala Arg Arg Glu Lys Ile Ser Lys
195 200 205

aaa atg aaa tat ctg caa gat att gtg cct gga tgc aat aag gtc aca 790
Lys Met Lys Tyr Leu Gln Asp Ile Val Pro Gly Cys Asn Lys Val Thr
210 215 220 225

gga aaa gct ggt atg ctt gat gag atc atc aat tat gtt caa tgt ctc 838
Gly Lys Ala Gly Met Leu Asp Glu Ile Ile Asn Tyr Val Gln Cys Leu
230 235 240

caa aga caa gtc gag ttc ctg tcg atg aaa ctt gct gtc ttg aac ccg 886
Gln Arg Gln Val Glu Phe Leu Ser Met Lys Leu Ala Val Leu Asn Pro
245 250 255

gaa cta gag ctt gcc gtg gaa gat gta tcc gta aaa cag gct tac ttt 934
Glu Leu Glu Leu Ala Val Glu Asp Val Ser Val Lys Gln Ala Tyr Phe
260 265 270

aca aat gta gtt gct tca aag caa tca ata atg gtt gat gtg cca ttg 982
Thr Asn Val Val Ala Ser Lys Gln Ser Ile Met Val Asp Val Pro Leu
275 280 285

ttt ccg tta gac cag caa gga tct cta gat ttg tct gcg ata aac ccg 1030
Phe Pro Leu Asp Gln Gln Gly Ser Leu Asp Leu Ser Ala Ile Asn Pro
290 295 300 305

aac caa acg aca tct atc gaa gct cca tct gga agc tgg gaa act caa 1078
Asn Gln Thr Thr Ser Ile Glu Ala Pro Ser Gly Ser Trp Glu Thr Gln
310 315 320

tca cag agt ctc tac aac aca tct agc ctc ggt ttt cat tac taa 1123
Ser Gln Ser Leu Tyr Asn Thr Ser Ser Leu Gly Phe His Tyr
325 330 335

gcaagattca ttgaaacaac atggttgaca tcaatcaatc atcaaaatca gaagcaaatt 1183

ctattacatt tgctcatcaa agtagtaatt tcgaaatttg gttaatgcat tatcctttga 1243

tccttgtttt ctgatattta aaccagaaga actggagata gcaatccaat gatcttgtca 1303

cca 1306

<210> 226 <211> 335 <212> PRT <213> Arabidopsis thaliana <400> 226

Met Leu Glu Gly Leu Val Ser Gln Glu Ser Leu Ser Leu Asn Ser Met
1 5 10 15

Asp Met Ser Val Leu Glu Arg Leu Lys Trp Val Gln Gln Gln Gln Gln

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            20                  25                  30

Gln Leu Gln Gln Val Val Ser His Ser Ser Asn Asn Ser Pro Glu Leu
        35                  40                  45

Leu Gln Ile Leu Gln Phe His Gly Ser Asn Asn Asp Glu Leu Leu Glu
    50                  55                  60

Ser Ser Phe Ser Gln Phe Gln Met Leu Gly Ser Gly Phe Gly Pro Asn
65                  70                  75                  80

Tyr Asn Met Gly Phe Gly Pro Pro His Glu Ser Ile Ser Arg Thr Ser
                85                  90                  95

Ser Cys His Met Glu Pro Val Asp Thr Met Glu Val Leu Leu Lys Thr
            100                 105                 110

Gly Glu Glu Thr Arg Ala Val Ala Leu Lys Asn Lys Arg Lys Pro Glu
        115                 120                 125

Val Lys Thr Arg Glu Glu Gln Lys Thr Glu Lys Lys Ile Lys Val Glu
    130                 135                 140

Ala Glu Thr Glu Ser Ser Met Lys Gly Lys Ser Asn Met Gly Asn Thr
145                 150                 155                 160

Glu Ala Ser Ser Asp Thr Ser Lys Glu Thr Ser Lys Gly Ala Ser Glu
                165                 170                 175

Asn Gln Lys Leu Asp Tyr Ile His Val Arg Ala Arg Arg Gly Gln Ala
            180                 185                 190

Thr Asp Arg His Ser Leu Ala Glu Arg Ala Arg Arg Glu Lys Ile Ser
        195                 200                 205

Lys Lys Met Lys Tyr Leu Gln Asp Ile Val Pro Gly Cys Asn Lys Val
    210                 215                 220

Thr Gly Lys Ala Gly Met Leu Asp Glu Ile Ile Asn Tyr Val Gln Cys
225                 230                 235                 240

Leu Gln Arg Gln Val Glu Phe Leu Ser Met Lys Leu Ala Val Leu Asn
                245                 250                 255
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Pro Glu Leu Glu Leu Ala Val Glu Asp Val Ser Val Lys Gln Ala Tyr
            260                 265                 270

Phe Thr Asn Val Val Ala Ser Lys Gln Ser Ile Met Val Asp Val Pro
        275                 280                 285

Leu Phe Pro Leu Asp Gln Gln Gly Ser Leu Asp Leu Ser Ala Ile Asn
    290                 295                 300

Pro Asn Gln Thr Thr Ser Ile Glu Ala Pro Ser Gly Ser Trp Glu Thr
305                 310                 315                 320

Gln Ser Gln Ser Leu Tyr Asn Thr Ser Ser Leu Gly Phe His Tyr
                325                 330                 335
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<210> 227 <211> 902 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (159)..(833) <223> G1499

<400> 227

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cctttaatat atatatatgc tcacacacac acatatatat atacatataa gcatcgcctc     120

aagcattaaa atttttacga accaaacaaa caaaaatt atg aat aat tat aat atg     176
                                        Met Asn Asn Tyr Asn Met
                                        1               5

aac cca tct ctc ttc caa aat tac act tgg aac aac atc atc aac agc       224
Asn Pro Ser Leu Phe Gln Asn Tyr Thr Trp Asn Asn Ile Ile Asn Ser
            10                  15                  20

agc aac aac aac aac aag aat gat gat cat cat cat caa cat aat aat       272
Ser Asn Asn Asn Asn Lys Asn Asp Asp His His His Gln His Asn Asn
        25                  30                  35

gat cca atc ggt atg gcc atg gac cag tac aca cag ctc cat atc ttc       320
Asp Pro Ile Gly Met Ala Met Asp Gln Tyr Thr Gln Leu His Ile Phe
    40                  45                  50

aat cct ttc tct tct tct cat ttc cct cct ctc tct tct tcc ctc aca       368
Asn Pro Phe Ser Ser Ser His Phe Pro Pro Leu Ser Ser Ser Leu Thr
55                  60                  65                  70

acc acc act ctt ctc tcc gga gat caa gaa gac gac gaa gac gaa gaa       416
Thr Thr Thr Leu Leu Ser Gly Asp Gln Glu Asp Asp Glu Asp Glu Glu
                75                  80                  85

gaa cct cta gag gaa ctc ggt gct atg aag gaa atg atg tac aag atc       464
Glu Pro Leu Glu Glu Leu Gly Ala Met Lys Glu Met Met Tyr Lys Ile
            90                  95                  100
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gca gcc atg caa tcg gtt gac atc gac cca gca acc gtc aag aaa ccc      512
Ala Ala Met Gln Ser Val Asp Ile Asp Pro Ala Thr Val Lys Lys Pro
        105                 110                 115

aaa cgc cgt aac gtg agg atc tcc gac gac cct cag agt gtg gcg gct      560
Lys Arg Arg Asn Val Arg Ile Ser Asp Asp Pro Gln Ser Val Ala Ala
    120                 125                 130

aga cat cgc cgt gag aga atc agt gag agg atc aga att ctt cag aga      608
Arg His Arg Arg Glu Arg Ile Ser Glu Arg Ile Arg Ile Leu Gln Arg
135                 140                 145                 150

ctc gtg cca ggt ggc act aaa atg gat acg gct tca atg ctc gat gaa      656
Leu Val Pro Gly Gly Thr Lys Met Asp Thr Ala Ser Met Leu Asp Glu
                155                 160                 165

gct ata cgc tat gtc aag ttc ttg aaa cgg cag atc cgg cta ctc aat      704
Ala Ile Arg Tyr Val Lys Phe Leu Lys Arg Gln Ile Arg Leu Leu Asn
            170                 175                 180

aat aat acc gga tat act cct ccg ccg ccg caa gat caa gct tct cag      752
Asn Asn Thr Gly Tyr Thr Pro Pro Pro Pro Gln Asp Gln Ala Ser Gln
        185                 190                 195

gcg gtg acg acg tca tgg gtt tca ccg cca cca ccg cca agt ttc ggc      800
Ala Val Thr Thr Ser Trp Val Ser Pro Pro Pro Pro Pro Ser Phe Gly
    200                 205                 210

cgt ggg gga aga gga gta gga gaa tta atc tag acaagatgac atttccatta    853
Arg Gly Gly Arg Gly Val Gly Glu Leu Ile
215                 220

gtagtaacta aattatgcta taatgtgtga gtaatggtgc aattatgga                902
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<210> 228 <211> 224 <212> PRT <213> Arabidopsis thaliana <400> 228

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Met Asn Asn Tyr Asn Met Asn Pro Ser Leu Phe Gln Asn Tyr Thr Trp
1               5                   10                  15

Asn Asn Ile Ile Asn Ser Ser Asn Asn Asn Asn Lys Asn Asp Asp His
            20                  25                  30

His His Gln His Asn Asn Asp Pro Ile Gly Met Ala Met Asp Gln Tyr
        35                  40                  45

Thr Gln Leu His Ile Phe Asn Pro Phe Ser Ser Ser His Phe Pro Pro
    50                  55                  60

Leu Ser Ser Ser Leu Thr Thr Thr Thr Leu Leu Ser Gly Asp Gln Glu
65                  70                  75                  80
```

```
Asp Asp Glu Asp Glu Glu Glu Pro Leu Glu Glu Leu Gly Ala Met Lys
                85                  90                  95

Glu Met Met Tyr Lys Ile Ala Ala Met Gln Ser Val Asp Ile Asp Pro
            100                 105                 110

Ala Thr Val Lys Lys Pro Lys Arg Arg Asn Val Arg Ile Ser Asp Asp
        115                 120                 125

Pro Gln Ser Val Ala Ala Arg His Arg Arg Glu Arg Ile Ser Glu Arg
    130                 135                 140

Ile Arg Ile Leu Gln Arg Leu Val Pro Gly Gly Thr Lys Met Asp Thr
145                 150                 155                 160

Ala Ser Met Leu Asp Glu Ala Ile Arg Tyr Val Lys Phe Leu Lys Arg
                165                 170                 175

Gln Ile Arg Leu Leu Asn Asn Asn Thr Gly Tyr Thr Pro Pro Pro Pro
            180                 185                 190

Gln Asp Gln Ala Ser Gln Ala Val Thr Thr Ser Trp Val Ser Pro Pro
        195                 200                 205

Pro Pro Pro Ser Phe Gly Arg Gly Gly Arg Gly Val Gly Glu Leu Ile
    210                 215                 220
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<210> 229 <211> 1233 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1233) <223> G1514

<400> 229

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atg gcc gaa act atg aaa gat att acg atg aag aac gat gaa tca cag       48
Met Ala Glu Thr Met Lys Asp Ile Thr Met Lys Asn Asp Glu Ser Gln
1               5                   10                  15

gaa gaa gaa atc ccc gat caa ttt ctc tgc tgc gtt tgc ctg gaa ctt       96
Glu Glu Glu Ile Pro Asp Gln Phe Leu Cys Cys Val Cys Leu Glu Leu
            20                  25                  30

ctt tac aag cca att gtg tta tct tgt ggt cat cta tca tgt ttt tgg      144
Leu Tyr Lys Pro Ile Val Leu Ser Cys Gly His Leu Ser Cys Phe Trp
        35                  40                  45

tgc gta cat aag tcc atg aat ggc ttt cgt gag tct cat tgt ccg ata      192
Cys Val His Lys Ser Met Asn Gly Phe Arg Glu Ser His Cys Pro Ile
    50                  55                  60
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tgt aga gac ccg tat gtt cac ttt ccc tct gtg tgc cag aag ctt tat      240
Cys Arg Asp Pro Tyr Val His Phe Pro Ser Val Cys Gln Lys Leu Tyr
65                  70                  75                  80

ttt ctg tta aag aag atg tac cca ctt gct cat aag aag aga gaa gaa      288
Phe Leu Leu Lys Lys Met Tyr Pro Leu Ala His Lys Lys Arg Glu Glu
                85                  90                  95

caa gtt tta aag gaa gag caa gaa cga gaa tgt ttt tct cct cag att      336
Gln Val Leu Lys Glu Glu Gln Glu Arg Glu Cys Phe Ser Pro Gln Ile
            100                 105                 110

gat ctt gtt ttg gat ttg tct gtg tgt agt gga gat tct ctc aat gtc      384
Asp Leu Val Leu Asp Leu Ser Val Cys Ser Gly Asp Ser Leu Asn Val
        115                 120                 125

tct gat aaa cag aag gtg gaa gag tgt tcg aat gca gcg aac tta tta      432
Ser Asp Lys Gln Lys Val Glu Glu Cys Ser Asn Ala Ala Asn Leu Leu
    130                 135                 140

tct agt tca tca agt aga ggt gac att cca tgt atc ccc aaa aat caa      480
Ser Ser Ser Ser Ser Arg Gly Asp Ile Pro Cys Ile Pro Lys Asn Gln
145                 150                 155                 160

gaa ccc aca gat gca aaa gct ctt aat gtt cat gaa aat gaa tta ctt      528
Glu Pro Thr Asp Ala Lys Ala Leu Asn Val His Glu Asn Glu Leu Leu
                165                 170                 175

aag gat aac aaa gtc agt aag cag att tcg aaa gat gat ttg ctc tgt      576
Lys Asp Asn Lys Val Ser Lys Gln Ile Ser Lys Asp Asp Leu Leu Cys
            180                 185                 190

tca gca tgt aag gag ctg ctt gta cga ccc gta gtt ctc aat tgc gga      624
Ser Ala Cys Lys Glu Leu Leu Val Arg Pro Val Val Leu Asn Cys Gly
        195                 200                 205

cat gtg tat tgt gaa gga tgt gta gta gat atg gct gaa gaa agc gaa      672
His Val Tyr Cys Glu Gly Cys Val Val Asp Met Ala Glu Glu Ser Glu
    210                 215                 220

aag atc aaa tgt caa gag tgt aat gtt tgt gac cca aga gga ttt cca      720
Lys Ile Lys Cys Gln Glu Cys Asn Val Cys Asp Pro Arg Gly Phe Pro
225                 230                 235                 240

aaa gtt tgt ttg att ctt gaa cag ctt ttg gag gaa aac ttt cct gaa      768
Lys Val Cys Leu Ile Leu Glu Gln Leu Leu Glu Glu Asn Phe Pro Glu
                245                 250                 255

gaa tac aat tca aga agc agt aag gtt cag aaa acg ctc gcc cat aat      816
Glu Tyr Asn Ser Arg Ser Ser Lys Val Gln Lys Thr Leu Ala His Asn
            260                 265                 270

agc aaa gga aat att caa agc tat ctc aaa gaa ggc ccg tcc tta tca      864
Ser Lys Gly Asn Ile Gln Ser Tyr Leu Lys Glu Gly Pro Ser Leu Ser
        275                 280                 285

aac gac aat aac aat gat gat ccc tgg ttg gca aac cct gga tca aat      912
```

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Asn Asp Asn Asn Asn Asp Asp Pro Trp Leu Ala Asn Pro Gly Ser Asn
    290                 295                 300

gtt cac ttt gga gct ggt tgt gat tct tgt ggg gtg tat cca atc ata      960
Val His Phe Gly Ala Gly Cys Asp Ser Cys Gly Val Tyr Pro Ile Ile
305                 310                 315                 320

ggg gat cga tac aga tgc aaa gac tgc aag gag gaa att ggg tat gac     1008
Gly Asp Arg Tyr Arg Cys Lys Asp Cys Lys Glu Glu Ile Gly Tyr Asp
                325                 330                 335

ctt tgc aaa gac tgt tac gag act cct tcg aaa gtt cca ggg aga ttc     1056
Leu Cys Lys Asp Cys Tyr Glu Thr Pro Ser Lys Val Pro Gly Arg Phe
            340                 345                 350

aac cag caa cac act cct gac cac agg ctt gag ctt gca cgg tct cct     1104
Asn Gln Gln His Thr Pro Asp His Arg Leu Glu Leu Ala Arg Ser Pro
        355                 360                 365

cag gtt ctg atc aat ttc aat tct atc ggt atc ctt ctc gga ccc gtt     1152
Gln Val Leu Ile Asn Phe Asn Ser Ile Gly Ile Leu Leu Gly Pro Val
    370                 375                 380

atc tca aat gaa ggc atg gat aca gat gaa ggc gag gaa ggg cct cct     1200
Ile Ser Asn Glu Gly Met Asp Thr Asp Glu Gly Glu Glu Gly Pro Pro
385                 390                 395                 400

ggt tct tct aat gag tca tca agc aca gaa tga                         1233
Gly Ser Ser Asn Glu Ser Ser Ser Thr Glu
                405                 410
```

<210> 230 <211> 410 <212> PRT <213> Arabidopsis thaliana <400> 230

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Met Ala Glu Thr Met Lys Asp Ile Thr Met Lys Asn Asp Glu Ser Gln
1               5                   10                  15

Glu Glu Glu Ile Pro Asp Gln Phe Leu Cys Cys Val Cys Leu Glu Leu
            20                  25                  30

Leu Tyr Lys Pro Ile Val Leu Ser Cys Gly His Leu Ser Cys Phe Trp
        35                  40                  45

Cys Val His Lys Ser Met Asn Gly Phe Arg Glu Ser His Cys Pro Ile
    50                  55                  60

Cys Arg Asp Pro Tyr Val His Phe Pro Ser Val Cys Gln Lys Leu Tyr
65                  70                  75                  80

Phe Leu Leu Lys Lys Met Tyr Pro Leu Ala His Lys Lys Arg Glu Glu
                85                  90                  95
```

Gln Val Leu Lys Glu Glu Gln Glu Arg Glu Cys Phe Ser Pro Gln Ile
100 105 110

Asp Leu Val Leu Asp Leu Ser Val Cys Ser Gly Asp Ser Leu Asn Val
115 120 125

Ser Asp Lys Gln Lys Val Glu Glu Cys Ser Asn Ala Ala Asn Leu Leu
130 135 140

Ser Ser Ser Ser Ser Arg Gly Asp Ile Pro Cys Ile Pro Lys Asn Gln
145 150 155 160

Glu Pro Thr Asp Ala Lys Ala Leu Asn Val His Glu Asn Glu Leu Leu
165 170 175

Lys Asp Asn Lys Val Ser Lys Gln Ile Ser Lys Asp Asp Leu Leu Cys
180 185 190

Ser Ala Cys Lys Glu Leu Leu Val Arg Pro Val Val Leu Asn Cys Gly
195 200 205

His Val Tyr Cys Glu Gly Cys Val Val Asp Met Ala Glu Glu Ser Glu
210 215 220

Lys Ile Lys Cys Gln Glu Cys Asn Val Cys Asp Pro Arg Gly Phe Pro
225 230 235 240

Lys Val Cys Leu Ile Leu Glu Gln Leu Leu Glu Glu Asn Phe Pro Glu
245 250 255

Glu Tyr Asn Ser Arg Ser Ser Lys Val Gln Lys Thr Leu Ala His Asn
260 265 270

Ser Lys Gly Asn Ile Gln Ser Tyr Leu Lys Glu Gly Pro Ser Leu Ser
275 280 285

Asn Asp Asn Asn Asn Asp Asp Pro Trp Leu Ala Asn Pro Gly Ser Asn
290 295 300

Val His Phe Gly Ala Gly Cys Asp Ser Cys Gly Val Tyr Pro Ile Ile
305 310 315 320

```
Gly Asp Arg Tyr Arg Cys Lys Asp Cys Lys Glu Glu Ile Gly Tyr Asp
                325                 330                 335

Leu Cys Lys Asp Cys Tyr Glu Thr Pro Ser Lys Val Pro Gly Arg Phe
            340                 345                 350

Asn Gln Gln His Thr Pro Asp His Arg Leu Glu Leu Ala Arg Ser Pro
        355                 360                 365

Gln Val Leu Ile Asn Phe Asn Ser Ile Gly Ile Leu Leu Gly Pro Val
    370                 375                 380

Ile Ser Asn Glu Gly Met Asp Thr Asp Glu Gly Glu Glu Gly Pro Pro
385                 390                 395                 400

Gly Ser Ser Asn Glu Ser Ser Ser Thr Glu
                405                 410
```

<210> 231 <211> 1146 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1146) <223> G1519

<400> 231

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Met Arg Leu Asn Gly Asp Ser Gly Pro Gly Gln Asp Glu Pro Gly Ser
1               5                   10                  15

agc ggg ttt cac ggc gga atc aga cga ttc ccg tta gca gct cag ccg       96
Ser Gly Phe His Gly Gly Ile Arg Arg Phe Pro Leu Ala Ala Gln Pro
            20                  25                  30

gag att atg aga gct gct gag aaa gac gat caa tac gct tct ttc atc      144
Glu Ile Met Arg Ala Ala Glu Lys Asp Asp Gln Tyr Ala Ser Phe Ile
        35                  40                  45

cac gaa gct tgc cgc gat gcc ttc cga cac ctt ttc ggt aca aga atc      192
His Glu Ala Cys Arg Asp Ala Phe Arg His Leu Phe Gly Thr Arg Ile
    50                  55                  60

gct ctt gct tac cag aag gag atg aag cta ctt gga cag atg ctt tac      240
Ala Leu Ala Tyr Gln Lys Glu Met Lys Leu Leu Gly Gln Met Leu Tyr
65                  70                  75                  80

tat gtt ctt acg aca ggt tca ggg caa caa act tta gga gag gaa tat      288
Tyr Val Leu Thr Thr Gly Ser Gly Gln Gln Thr Leu Gly Glu Glu Tyr
                85                  90                  95

tgt gac att ata cag gtt gca ggg cct tat gga ctc tct cct aca cca      336
Cys Asp Ile Ile Gln Val Ala Gly Pro Tyr Gly Leu Ser Pro Thr Pro
            100                 105                 110

gct aga cgt gct ttg ttc ata ttg tac cag acc gca gtt cca tat atc      384
```

```
Ala Arg Arg Ala Leu Phe Ile Leu Tyr Gln Thr Ala Val Pro Tyr Ile
        115                 120                 125

gca gag aga att agc act cga gct gct acg caa gca gtc acc ttt gat      432
Ala Glu Arg Ile Ser Thr Arg Ala Ala Thr Gln Ala Val Thr Phe Asp
    130                 135                 140

gag tct gat gag ttt ttt ggt gat agt cat atc cac tca cca aga atg      480
Glu Ser Asp Glu Phe Phe Gly Asp Ser His Ile His Ser Pro Arg Met
145                 150                 155                 160

ata gat ctt cca tct tca tct caa gtt gaa act tca act tct gta gta      528
Ile Asp Leu Pro Ser Ser Ser Gln Val Glu Thr Ser Thr Ser Val Val
                165                 170                 175

tct agg tta aac gat aga ctt atg aga tcg tgg cac cga gct att cag      576
Ser Arg Leu Asn Asp Arg Leu Met Arg Ser Trp His Arg Ala Ile Gln
            180                 185                 190

cga tgg cct gtg gtt ctt cct gtt gcc cgc gaa gtc tta caa ctg gtt      624
Arg Trp Pro Val Val Leu Pro Val Ala Arg Glu Val Leu Gln Leu Val
        195                 200                 205

ttg cgt gcc aat ctg atg ctc ttc tac ttt gaa ggt ttt tat tat cat      672
Leu Arg Ala Asn Leu Met Leu Phe Tyr Phe Glu Gly Phe Tyr Tyr His
    210                 215                 220

ata tcg aaa cgt gca tcc ggg gtt cgt tat gtt ttc ata gga aag caa      720
Ile Ser Lys Arg Ala Ser Gly Val Arg Tyr Val Phe Ile Gly Lys Gln
225                 230                 235                 240

ctg aat cag aga cct aga tac caa att ctt ggg gtt ttc ctt cta atc      768
Leu Asn Gln Arg Pro Arg Tyr Gln Ile Leu Gly Val Phe Leu Leu Ile
                245                 250                 255

caa ttg tgc atc ctt gct gct gag ggc ttg cgt cgg agt aat ttg tca      816
Gln Leu Cys Ile Leu Ala Ala Glu Gly Leu Arg Arg Ser Asn Leu Ser
            260                 265                 270

tct atc act agc tcc att cag cag gct tct ata gga tct tat caa act      864
Ser Ile Thr Ser Ser Ile Gln Gln Ala Ser Ile Gly Ser Tyr Gln Thr
        275                 280                 285

tca gga ggg aga ggt tta cct gtt tta aat gaa gag ggg aat ttg ata      912
Ser Gly Gly Arg Gly Leu Pro Val Leu Asn Glu Glu Gly Asn Leu Ile
    290                 295                 300

act tcg gaa gct gaa aag gga aac tgg tct acc tcc gat tca act tca      960
Thr Ser Glu Ala Glu Lys Gly Asn Trp Ser Thr Ser Asp Ser Thr Ser
305                 310                 315                 320

acg gag gca gta ggg aaa tgc act ctc tgc tta agc acc cgt cag cac     1008
Thr Glu Ala Val Gly Lys Cys Thr Leu Cys Leu Ser Thr Arg Gln His
                325                 330                 335

cca acg gcc act cct tgt ggt cat gtg ttt tgt tgg agc tgc att atg     1056
Pro Thr Ala Thr Pro Cys Gly His Val Phe Cys Trp Ser Cys Ile Met
```

```
            340                 345                 350

gaa tgg tgc aac gag aag caa gaa tgc cct ctt tgt cga acg ccc aat     1104
Glu Trp Cys Asn Glu Lys Gln Glu Cys Pro Leu Cys Arg Thr Pro Asn
        355                 360                 365

acc cat tca agt ttg gtt tgt ttg tat cat tct gat ttt tag             1146
Thr His Ser Ser Leu Val Cys Leu Tyr His Ser Asp Phe
    370                 375                 380


<210>  232 <211>  381 <212>  PRT <213>  Arabidopsis thaliana  <400>  232

Met Arg Leu Asn Gly Asp Ser Gly Pro Gly Gln Asp Glu Pro Gly Ser
1               5                   10                  15

Ser Gly Phe His Gly Gly Ile Arg Arg Phe Pro Leu Ala Ala Gln Pro
            20                  25                  30

Glu Ile Met Arg Ala Ala Glu Lys Asp Asp Gln Tyr Ala Ser Phe Ile
        35                  40                  45

His Glu Ala Cys Arg Asp Ala Phe Arg His Leu Phe Gly Thr Arg Ile
    50                  55                  60

Ala Leu Ala Tyr Gln Lys Glu Met Lys Leu Leu Gly Gln Met Leu Tyr
65                  70                  75                  80

Tyr Val Leu Thr Thr Gly Ser Gly Gln Gln Thr Leu Gly Glu Glu Tyr
                85                  90                  95

Cys Asp Ile Ile Gln Val Ala Gly Pro Tyr Gly Leu Ser Pro Thr Pro
            100                 105                 110

Ala Arg Arg Ala Leu Phe Ile Leu Tyr Gln Thr Ala Val Pro Tyr Ile
        115                 120                 125

Ala Glu Arg Ile Ser Thr Arg Ala Ala Thr Gln Ala Val Thr Phe Asp
    130                 135                 140

Glu Ser Asp Glu Phe Phe Gly Asp Ser His Ile His Ser Pro Arg Met
145                 150                 155                 160

Ile Asp Leu Pro Ser Ser Ser Gln Val Glu Thr Ser Thr Ser Val Val
                165                 170                 175
```

Replacement Sheet

Ser Arg Leu Asn Asp Arg Leu Met Arg Ser Trp His Arg Ala Ile Gln
180 185 190

Arg Trp Pro Val Val Leu Pro Val Ala Arg Glu Val Leu Gln Leu Val
195 200 205

Leu Arg Ala Asn Leu Met Leu Phe Tyr Phe Glu Gly Phe Tyr Tyr His
210 215 220

Ile Ser Lys Arg Ala Ser Gly Val Arg Tyr Val Phe Ile Gly Lys Gln
225 230 235 240

Leu Asn Gln Arg Pro Arg Tyr Gln Ile Leu Gly Val Phe Leu Leu Ile
245 250 255

Gln Leu Cys Ile Leu Ala Ala Glu Gly Leu Arg Arg Ser Asn Leu Ser
260 265 270

Ser Ile Thr Ser Ser Ile Gln Gln Ala Ser Ile Gly Ser Tyr Gln Thr
275 280 285

Ser Gly Gly Arg Gly Leu Pro Val Leu Asn Glu Glu Gly Asn Leu Ile
290 295 300

Thr Ser Glu Ala Glu Lys Gly Asn Trp Ser Thr Ser Asp Ser Thr Ser
305 310 315 320

Thr Glu Ala Val Gly Lys Cys Thr Leu Cys Leu Ser Thr Arg Gln His
325 330 335

Pro Thr Ala Thr Pro Cys Gly His Val Phe Cys Trp Ser Cys Ile Met
340 345 350

Glu Trp Cys Asn Glu Lys Gln Glu Cys Pro Leu Cys Arg Thr Pro Asn
355 360 365

Thr His Ser Ser Leu Val Cys Leu Tyr His Ser Asp Phe
370 375 380

<210> 233 <211> 891 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(891) <223> G1521

<400> 233
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Met Pro Pro Leu Pro Ser Ser Thr Ala Pro Ser Ser Ser Arg His Leu
1               5                  10                  15

cga tcg ccg gaa agt atc gcg aaa ttt gca ggg aga gca ata ttt cct      96
Arg Ser Pro Glu Ser Ile Ala Lys Phe Ala Gly Arg Ala Ile Phe Pro
            20                  25                  30

gct tta cag ggg aaa tcg tgt ccg ata tgc ctc gaa aat cta acc gag     144
Ala Leu Gln Gly Lys Ser Cys Pro Ile Cys Leu Glu Asn Leu Thr Glu
        35                  40                  45

cga aga tcc gcc gcc gtg atc acg gtg tgc aag cac gga tac tgc ctt     192
Arg Arg Ser Ala Ala Val Ile Thr Val Cys Lys His Gly Tyr Cys Leu
    50                  55                  60

gct tgt att cgg aag tgg agc agc ttc aag agg aat tgt cct ctt tgt     240
Ala Cys Ile Arg Lys Trp Ser Ser Phe Lys Arg Asn Cys Pro Leu Cys
65                  70                  75                  80

aac act cgt ttt gat tcc tgg ttt atc gtt agt gat ttt gct tct aga     288
Asn Thr Arg Phe Asp Ser Trp Phe Ile Val Ser Asp Phe Ala Ser Arg
                85                  90                  95

aaa tac cat aag gag caa tta cca att ctt cgt gat cgt gag act tta     336
Lys Tyr His Lys Glu Gln Leu Pro Ile Leu Arg Asp Arg Glu Thr Leu
            100                 105                 110

act tat cat cgg aat aat cct tcc gat cgc cgg agg ata att caa agg     384
Thr Tyr His Arg Asn Asn Pro Ser Asp Arg Arg Arg Ile Ile Gln Arg
        115                 120                 125

tcg agg gat gtt ttg gaa aac tct agc tca aga tca agg cca ttg cca     432
Ser Arg Asp Val Leu Glu Asn Ser Ser Ser Arg Ser Arg Pro Leu Pro
    130                 135                 140

tgg cgg aga tca ttt gga cga cca ggt tca gtt cct gat tct gtt atc     480
Trp Arg Arg Ser Phe Gly Arg Pro Gly Ser Val Pro Asp Ser Val Ile
145                 150                 155                 160

ttc cag cga aag ctt cag tgg cga gct agc ata tac act aag caa tta     528
Phe Gln Arg Lys Leu Gln Trp Arg Ala Ser Ile Tyr Thr Lys Gln Leu
                165                 170                 175

cga gct gtt cga tta cat tca agg cgc ttg gaa cta agt ttg gcg gtg     576
Arg Ala Val Arg Leu His Ser Arg Arg Leu Glu Leu Ser Leu Ala Val
            180                 185                 190

aat gat tac acc aaa gca aag ata act gaa aga att gag cca tgg att     624
Asn Asp Tyr Thr Lys Ala Lys Ile Thr Glu Arg Ile Glu Pro Trp Ile
        195                 200                 205

aga aga gag ctt cag gca gtc ctt gga gat cct gat ccc tca gtt att     672
Arg Arg Glu Leu Gln Ala Val Leu Gly Asp Pro Asp Pro Ser Val Ile
    210                 215                 220

gtt cat ttt gcg tca gct ctt ttc atc aaa agg ctt gag aga gag aat     720
Val His Phe Ala Ser Ala Leu Phe Ile Lys Arg Leu Glu Arg Glu Asn
```

```
225                 230                 235                 240

aat cga caa acc ggg cag acc ggg atg ttg gtg gaa gat gaa gtc tcc      768
Asn Arg Gln Thr Gly Gln Thr Gly Met Leu Val Glu Asp Glu Val Ser
                245                 250                 255

tct ctt cga aaa ttc ttg tct gat aag gtg gat ata ttt tgg cat gaa      816
Ser Leu Arg Lys Phe Leu Ser Asp Lys Val Asp Ile Phe Trp His Glu
            260                 265                 270

cta aga tgt ttt gcg gag agt ata ctc acg atg gag act tat gat gca      864
Leu Arg Cys Phe Ala Glu Ser Ile Leu Thr Met Glu Thr Tyr Asp Ala
        275                 280                 285

gtg gtt gaa tac aat gag gtg gag taa                                  891
Val Val Glu Tyr Asn Glu Val Glu
    290                 295
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<210> 234 <211> 296 <212> PRT <213> Arabidopsis thaliana <400> 234

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Met Pro Pro Leu Pro Ser Ser Thr Ala Pro Ser Ser Ser Arg His Leu
1               5                   10                  15

Arg Ser Pro Glu Ser Ile Ala Lys Phe Ala Gly Arg Ala Ile Phe Pro
            20                  25                  30

Ala Leu Gln Gly Lys Ser Cys Pro Ile Cys Leu Glu Asn Leu Thr Glu
        35                  40                  45

Arg Arg Ser Ala Ala Val Ile Thr Val Cys Lys His Gly Tyr Cys Leu
    50                  55                  60

Ala Cys Ile Arg Lys Trp Ser Ser Phe Lys Arg Asn Cys Pro Leu Cys
65                  70                  75                  80

Asn Thr Arg Phe Asp Ser Trp Phe Ile Val Ser Asp Phe Ala Ser Arg
                85                  90                  95

Lys Tyr His Lys Glu Gln Leu Pro Ile Leu Arg Asp Arg Glu Thr Leu
            100                 105                 110

Thr Tyr His Arg Asn Asn Pro Ser Asp Arg Arg Arg Ile Ile Gln Arg
        115                 120                 125

Ser Arg Asp Val Leu Glu Asn Ser Ser Ser Arg Ser Arg Pro Leu Pro
    130                 135                 140
```

Trp Arg Arg Ser Phe Gly Arg Pro Gly Ser Val Pro Asp Ser Val Ile
145 150 155 160

Phe Gln Arg Lys Leu Gln Trp Arg Ala Ser Ile Tyr Thr Lys Gln Leu
165 170 175

Arg Ala Val Arg Leu His Ser Arg Arg Leu Glu Leu Ser Leu Ala Val
180 185 190

Asn Asp Tyr Thr Lys Ala Lys Ile Thr Glu Arg Ile Glu Pro Trp Ile
195 200 205

Arg Arg Glu Leu Gln Ala Val Leu Gly Asp Pro Asp Pro Ser Val Ile
210 215 220

Val His Phe Ala Ser Ala Leu Phe Ile Lys Arg Leu Glu Arg Glu Asn
225 230 235 240

Asn Arg Gln Thr Gly Gln Thr Gly Met Leu Val Glu Asp Glu Val Ser
245 250 255

Ser Leu Arg Lys Phe Leu Ser Asp Lys Val Asp Ile Phe Trp His Glu
260 265 270

Leu Arg Cys Phe Ala Glu Ser Ile Leu Thr Met Glu Thr Tyr Asp Ala
275 280 285

Val Val Glu Tyr Asn Glu Val Glu
290 295

<210> 235 <211> 3090 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(3090) <223> G1526

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Met Gly Thr Lys Val Ser Asp Asp Leu Val Ser Thr Val Arg Ser Val
1 5 10 15

gtg ggt tcc gat tac tca gat atg gat ata atc agg gct tta cac atg 96
Val Gly Ser Asp Tyr Ser Asp Met Asp Ile Ile Arg Ala Leu His Met
20 25 30

gcg aat cat gat cca acg gct gct atc aat ata atc ttc gac act cca 144
Ala Asn His Asp Pro Thr Ala Ala Ile Asn Ile Ile Phe Asp Thr Pro
35 40 45

agt ttc gcc aaa cct gat gta gcc act cct acc ccg agc ggc tct aat 192

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Ser Phe Ala Lys Pro Asp Val Ala Thr Pro Thr Pro Ser Gly Ser Asn
    50                  55                  60

gga ggg aag cga gtt gat agt gga tta aag ggc tgt act ttt ggt gac      240
Gly Gly Lys Arg Val Asp Ser Gly Leu Lys Gly Cys Thr Phe Gly Asp
65                  70                  75                  80

agc gga agt gtt gga gcg aat cat cgc gtg gag gaa gaa aat gag agt      288
Ser Gly Ser Val Gly Ala Asn His Arg Val Glu Glu Glu Asn Glu Ser
                85                  90                  95

gtt aat ggt gga gga gaa gag agt gtt tca ggg aat gag tgg tgg ttt      336
Val Asn Gly Gly Gly Glu Glu Ser Val Ser Gly Asn Glu Trp Trp Phe
            100                 105                 110

gtt ggt tgt tct gaa ttg gct ggg tta tcg aca tgt aaa gga agg aaa      384
Val Gly Cys Ser Glu Leu Ala Gly Leu Ser Thr Cys Lys Gly Arg Lys
        115                 120                 125

ttg aag tct ggt gat gaa ttg gtg ttc acg ttt ccg cat agt aaa gga      432
Leu Lys Ser Gly Asp Glu Leu Val Phe Thr Phe Pro His Ser Lys Gly
    130                 135                 140

tta aag cct gag act acg cct ggg aag cgc ggt ttt ggg cgg gga agg      480
Leu Lys Pro Glu Thr Thr Pro Gly Lys Arg Gly Phe Gly Arg Gly Arg
145                 150                 155                 160

cca gct ttg cgt ggt gct tct gat atc gtt agg ttc tct aca aag gat      528
Pro Ala Leu Arg Gly Ala Ser Asp Ile Val Arg Phe Ser Thr Lys Asp
                165                 170                 175

tca gga gag att ggt aga ata cca aac gag tgg gct cgg tgt ctt cta      576
Ser Gly Glu Ile Gly Arg Ile Pro Asn Glu Trp Ala Arg Cys Leu Leu
            180                 185                 190

cca ctt gtg aga gac aag aaa att agg ata gaa ggc agt tgc aag tcg      624
Pro Leu Val Arg Asp Lys Lys Ile Arg Ile Glu Gly Ser Cys Lys Ser
        195                 200                 205

gcg cct gaa gct ttg agc atc atg gat aca att ctt ctg tct gta agc      672
Ala Pro Glu Ala Leu Ser Ile Met Asp Thr Ile Leu Leu Ser Val Ser
    210                 215                 220

gtg tac att aat agt tcc atg ttt caa aag cat agt gcg act tca ttt      720
Val Tyr Ile Asn Ser Ser Met Phe Gln Lys His Ser Ala Thr Ser Phe
225                 230                 235                 240

aag aca gct agt aat acg gca gag gaa tca atg ttc cat cct ctc cca      768
Lys Thr Ala Ser Asn Thr Ala Glu Glu Ser Met Phe His Pro Leu Pro
                245                 250                 255

aat ctc ttt cgg tta ctc ggt ttg atc ccc ttt aag aag gca gag ttt      816
Asn Leu Phe Arg Leu Leu Gly Leu Ile Pro Phe Lys Lys Ala Glu Phe
            260                 265                 270

act cca gag gat ttt tac tct aag aag cga cct ttg agt tcc aag gat      864
Thr Pro Glu Asp Phe Tyr Ser Lys Lys Arg Pro Leu Ser Ser Lys Asp
```

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        275                 280                 285

ggt tct gct att cct act tcg ttg ctt caa tta aac aag gtc aag aat      912
Gly Ser Ala Ile Pro Thr Ser Leu Leu Gln Leu Asn Lys Val Lys Asn
    290                 295                 300

atg aat caa gat gca aac gga gat gaa aat gag cag tgt atc agc gat      960
Met Asn Gln Asp Ala Asn Gly Asp Glu Asn Glu Gln Cys Ile Ser Asp
305                 310                 315                 320

ggt gat ctt gat aac att gtt ggt gtt ggg gac agt tct gga tta aag     1008
Gly Asp Leu Asp Asn Ile Val Gly Val Gly Asp Ser Ser Gly Leu Lys
                325                 330                 335

gaa atg gaa act cca cat aca ctt ctg tgt gag ctt cgt cca tac caa     1056
Glu Met Glu Thr Pro His Thr Leu Leu Cys Glu Leu Arg Pro Tyr Gln
            340                 345                 350

aag cag gca ctt cat tgg atg acc caa ctg gag aaa gga aat tgc act     1104
Lys Gln Ala Leu His Trp Met Thr Gln Leu Glu Lys Gly Asn Cys Thr
        355                 360                 365

gat gag gca gca aca atg ctt cac ccg tgt tgg gaa gca tac tgt tta     1152
Asp Glu Ala Ala Thr Met Leu His Pro Cys Trp Glu Ala Tyr Cys Leu
    370                 375                 380

gca gac aag agg gaa ctg gtt gtc tac ctg aat tct ttt act ggt gat     1200
Ala Asp Lys Arg Glu Leu Val Val Tyr Leu Asn Ser Phe Thr Gly Asp
385                 390                 395                 400

gct aca ata cac ttc cct agc aca ctt caa atg gca aga gga gga ata     1248
Ala Thr Ile His Phe Pro Ser Thr Leu Gln Met Ala Arg Gly Gly Ile
                405                 410                 415

tta gca gac gca atg ggt ctt gga aag act gta atg acc ata tcc ctt     1296
Leu Ala Asp Ala Met Gly Leu Gly Lys Thr Val Met Thr Ile Ser Leu
            420                 425                 430

ttg ctt gcc cat tct tgg aaa gct gca tca act ggg ttt cta tgc ccc     1344
Leu Leu Ala His Ser Trp Lys Ala Ala Ser Thr Gly Phe Leu Cys Pro
        435                 440                 445

aac tat gaa gga gac aaa gtg atc agc agt tct gta gat gat ctc act     1392
Asn Tyr Glu Gly Asp Lys Val Ile Ser Ser Ser Val Asp Asp Leu Thr
    450                 455                 460

agt ccc ccg gtg aag gca acc aaa ttt cta ggc ttt gat aag agg ctt     1440
Ser Pro Pro Val Lys Ala Thr Lys Phe Leu Gly Phe Asp Lys Arg Leu
465                 470                 475                 480

ctt gaa caa aaa agt gta ctt caa aat ggt ggt aac ctg att gta tgt     1488
Leu Glu Gln Lys Ser Val Leu Gln Asn Gly Gly Asn Leu Ile Val Cys
                485                 490                 495

ccg atg aca ctt tta gga cag tgg aag aca gag att gaa atg cat gca     1536
Pro Met Thr Leu Leu Gly Gln Trp Lys Thr Glu Ile Glu Met His Ala
            500                 505                 510
```

```
aag cct ggg tct cta tct gtc tat gtt cac tat ggg caa agc agg ccg     1584
Lys Pro Gly Ser Leu Ser Val Tyr Val His Tyr Gly Gln Ser Arg Pro
        515                 520                 525

aag gat gca aaa ctt ctt tcc cag agt gat gtg gta atc acc aca tat     1632
Lys Asp Ala Lys Leu Leu Ser Gln Ser Asp Val Val Ile Thr Thr Tyr
    530                 535                 540

gga gtt cta aca tcc gaa ttc tcg caa gag aac tca gca gac cat gaa     1680
Gly Val Leu Thr Ser Glu Phe Ser Gln Glu Asn Ser Ala Asp His Glu
545                 550                 555                 560

gga att tat gca gtt cga tgg ttt agg att gtt ctt gac gag gca cat     1728
Gly Ile Tyr Ala Val Arg Trp Phe Arg Ile Val Leu Asp Glu Ala His
                565                 570                 575

acc atc aaa aac tca aaa agc caa att tcc ttg gct gct gca gct ctg     1776
Thr Ile Lys Asn Ser Lys Ser Gln Ile Ser Leu Ala Ala Ala Ala Leu
            580                 585                 590

gtt gct gat agg cgt tgg tgt ctt acg ggt act cct att cag aac aat     1824
Val Ala Asp Arg Arg Trp Cys Leu Thr Gly Thr Pro Ile Gln Asn Asn
        595                 600                 605

ctg gag gat tta tac agc ctt cta cgg ttt ttg agg att gaa cca tgg     1872
Leu Glu Asp Leu Tyr Ser Leu Leu Arg Phe Leu Arg Ile Glu Pro Trp
    610                 615                 620

gga act tgg gca tgg tgg aat aaa ctt gtc caa aag cca ttt gaa gag     1920
Gly Thr Trp Ala Trp Trp Asn Lys Leu Val Gln Lys Pro Phe Glu Glu
625                 630                 635                 640

ggt gat gag aga ggg tta aag cta gtg cag tct atc tta aaa cct atc     1968
Gly Asp Glu Arg Gly Leu Lys Leu Val Gln Ser Ile Leu Lys Pro Ile
                645                 650                 655

atg ctt agg aga aca aag tct agc aca gac cga gaa gga agg ccg att     2016
Met Leu Arg Arg Thr Lys Ser Ser Thr Asp Arg Glu Gly Arg Pro Ile
            660                 665                 670

ctt gtt cta ccc cct gct gat gca cgg gtc att tac tgt gaa ctt tcg     2064
Leu Val Leu Pro Pro Ala Asp Ala Arg Val Ile Tyr Cys Glu Leu Ser
        675                 680                 685

gag tct gag agg gat ttc tac gac gcg cta ttt aaa aga tcc aag gtc     2112
Glu Ser Glu Arg Asp Phe Tyr Asp Ala Leu Phe Lys Arg Ser Lys Val
    690                 695                 700

aaa ttt gat caa ttt gtt gaa caa ggc aaa gtt ctt cat aac tat gct     2160
Lys Phe Asp Gln Phe Val Glu Gln Gly Lys Val Leu His Asn Tyr Ala
705                 710                 715                 720

tcg atc ctg gaa ctg ctt ttg cgt ctt cga caa tgt tgt gat cac cca     2208
Ser Ile Leu Glu Leu Leu Leu Arg Leu Arg Gln Cys Cys Asp His Pro
                725                 730                 735
```

```
ttt tta gta atg agt cga ggg gat aca gcg gaa tac tct gat ctg aat     2256
Phe Leu Val Met Ser Arg Gly Asp Thr Ala Glu Tyr Ser Asp Leu Asn
            740                 745                 750

aag ctt tct aaa cgt ttc ctt agt gga aag tct tct ggc tta gaa agg     2304
Lys Leu Ser Lys Arg Phe Leu Ser Gly Lys Ser Ser Gly Leu Glu Arg
        755                 760                 765

gaa gga aaa gat gta ccg tca gag gct ttt gtt cag gag gtg gta gag     2352
Glu Gly Lys Asp Val Pro Ser Glu Ala Phe Val Gln Glu Val Val Glu
    770                 775                 780

gaa ctg cgc aaa gga gag caa gga gag tgt cca ata tgc ctt gaa gca     2400
Glu Leu Arg Lys Gly Glu Gln Gly Glu Cys Pro Ile Cys Leu Glu Ala
785                 790                 795                 800

ctt gag gat gct gta tta acg cca tgt gct cat aga tta tgt cgt gag     2448
Leu Glu Asp Ala Val Leu Thr Pro Cys Ala His Arg Leu Cys Arg Glu
                805                 810                 815

tgt ctc ttg gca agt tgg aga aat tct act tct ggg tta tgt cct gtg     2496
Cys Leu Leu Ala Ser Trp Arg Asn Ser Thr Ser Gly Leu Cys Pro Val
            820                 825                 830

tgt agg aac act gta agc aaa caa gaa ctc atc aca gca cca acc gaa     2544
Cys Arg Asn Thr Val Ser Lys Gln Glu Leu Ile Thr Ala Pro Thr Glu
        835                 840                 845

agt aga ttc cag gtt gac gtg gaa aag aat tgg gtg gaa tca tcg aaa     2592
Ser Arg Phe Gln Val Asp Val Glu Lys Asn Trp Val Glu Ser Ser Lys
    850                 855                 860

atc act gct ctt ctg gaa gag ctt gaa ggt ctt cgt tct tca ggc tct     2640
Ile Thr Ala Leu Leu Glu Glu Leu Glu Gly Leu Arg Ser Ser Gly Ser
865                 870                 875                 880

aag agc att ctc ttt agc cag tgg acc gct ttc ctc gat ctc ctc caa     2688
Lys Ser Ile Leu Phe Ser Gln Trp Thr Ala Phe Leu Asp Leu Leu Gln
                885                 890                 895

att ccc ctc tct cgg aat aac ttt tca ttt gtc cgt ctt gat ggc acg     2736
Ile Pro Leu Ser Arg Asn Asn Phe Ser Phe Val Arg Leu Asp Gly Thr
            900                 905                 910

cta agt cag cag caa cga gag aag gtc ctt aaa gaa ttt tcc gaa gat     2784
Leu Ser Gln Gln Gln Arg Glu Lys Val Leu Lys Glu Phe Ser Glu Asp
        915                 920                 925

ggc agt atc ctg gta ctg ttg atg tct cta aaa gct ggt ggc gtt ggg     2832
Gly Ser Ile Leu Val Leu Leu Met Ser Leu Lys Ala Gly Gly Val Gly
    930                 935                 940

ata aat cta aca gct gcg tcc aat gct ttt gtc atg gat cca tgg tgg     2880
Ile Asn Leu Thr Ala Ala Ser Asn Ala Phe Val Met Asp Pro Trp Trp
945                 950                 955                 960

aac cca gcg gta gag gaa caa gct gtt atg cgt att cat cgt ata ggg     2928
```

Patented Sequence Listing

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Asn Pro Ala Val Glu Glu Gln Ala Val Met Arg Ile His Arg Ile Gly
                965                 970                 975

caa act aag gaa gtc aaa atc aga aga ttc atc gtt aag gga acg gtt     2976
Gln Thr Lys Glu Val Lys Ile Arg Arg Phe Ile Val Lys Gly Thr Val
            980                 985                 990

gaa gag aga atg gag gcg gtt cag  gcg agg aag cag aga  atg atc tct   3024
Glu Glu Arg Met Glu Ala Val Gln  Ala Arg Lys Gln Arg  Met Ile Ser
        995                 1000                1005

ggg gct  tta acc gat caa gaa  gta cga agt gca cgt  ata gag gaa      3069
Gly Ala  Leu Thr Asp Gln Glu  Val Arg Ser Ala Arg  Ile Glu Glu
    1010                1015                1020

ctc aag  atg tta ttt acc tga                                      3090
Leu Lys  Met Leu Phe Thr
    1025
```

09/24/2005 15:00:00

<210> 236 <211> 1029 <212> PRT <213> Arabidopsis thaliana <400> 236

```
Met Gly Thr Lys Val Ser Asp Asp Leu Val Ser Thr Val Arg Ser Val
1               5                   10                  15

Val Gly Ser Asp Tyr Ser Asp Met Asp Ile Ile Arg Ala Leu His Met
            20                  25                  30

Ala Asn His Asp Pro Thr Ala Ala Ile Asn Ile Ile Phe Asp Thr Pro
        35                  40                  45

Ser Phe Ala Lys Pro Asp Val Ala Thr Pro Thr Pro Ser Gly Ser Asn
    50                  55                  60

Gly Gly Lys Arg Val Asp Ser Gly Leu Lys Gly Cys Thr Phe Gly Asp
65                  70                  75                  80

Ser Gly Ser Val Gly Ala Asn His Arg Val Glu Glu Glu Asn Glu Ser
                85                  90                  95

Val Asn Gly Gly Gly Glu Glu Ser Val Ser Gly Asn Glu Trp Trp Phe
            100                 105                 110

Val Gly Cys Ser Glu Leu Ala Gly Leu Ser Thr Cys Lys Gly Arg Lys
        115                 120                 125

Leu Lys Ser Gly Asp Glu Leu Val Phe Thr Phe Pro His Ser Lys Gly
    130                 135                 140
```

```
Leu Lys Pro Glu Thr Thr Pro Gly Lys Arg Gly Phe Gly Arg Gly Arg
145                 150                 155                 160

Pro Ala Leu Arg Gly Ala Ser Asp Ile Val Arg Phe Ser Thr Lys Asp
                165                 170                 175

Ser Gly Glu Ile Gly Arg Ile Pro Asn Glu Trp Ala Arg Cys Leu Leu
            180                 185                 190

Pro Leu Val Arg Asp Lys Lys Ile Arg Ile Glu Gly Ser Cys Lys Ser
        195                 200                 205

Ala Pro Glu Ala Leu Ser Ile Met Asp Thr Ile Leu Leu Ser Val Ser
    210                 215                 220

Val Tyr Ile Asn Ser Ser Met Phe Gln Lys His Ser Ala Thr Ser Phe
225                 230                 235                 240

Lys Thr Ala Ser Asn Thr Ala Glu Glu Ser Met Phe His Pro Leu Pro
                245                 250                 255

Asn Leu Phe Arg Leu Leu Gly Leu Ile Pro Phe Lys Lys Ala Glu Phe
            260                 265                 270

Thr Pro Glu Asp Phe Tyr Ser Lys Lys Arg Pro Leu Ser Ser Lys Asp
        275                 280                 285

Gly Ser Ala Ile Pro Thr Ser Leu Leu Gln Leu Asn Lys Val Lys Asn
    290                 295                 300

Met Asn Gln Asp Ala Asn Gly Asp Glu Asn Glu Gln Cys Ile Ser Asp
305                 310                 315                 320

Gly Asp Leu Asp Asn Ile Val Gly Val Gly Asp Ser Ser Gly Leu Lys
                325                 330                 335

Glu Met Glu Thr Pro His Thr Leu Leu Cys Glu Leu Arg Pro Tyr Gln
            340                 345                 350

Lys Gln Ala Leu His Trp Met Thr Gln Leu Glu Lys Gly Asn Cys Thr
        355                 360                 365
```

Asp Glu Ala Ala Thr Met Leu His Pro Cys Trp Glu Ala Tyr Cys Leu
370 375 380

Ala Asp Lys Arg Glu Leu Val Val Tyr Leu Asn Ser Phe Thr Gly Asp
385 390 395 400

Ala Thr Ile His Phe Pro Ser Thr Leu Gln Met Ala Arg Gly Gly Ile
405 410 415

Leu Ala Asp Ala Met Gly Leu Gly Lys Thr Val Met Thr Ile Ser Leu
420 425 430

Leu Leu Ala His Ser Trp Lys Ala Ala Ser Thr Gly Phe Leu Cys Pro
435 440 445

Asn Tyr Glu Gly Asp Lys Val Ile Ser Ser Ser Val Asp Asp Leu Thr
450 455 460

Ser Pro Pro Val Lys Ala Thr Lys Phe Leu Gly Phe Asp Lys Arg Leu
465 470 475 480

Leu Glu Gln Lys Ser Val Leu Gln Asn Gly Gly Asn Leu Ile Val Cys
485 490 495

Pro Met Thr Leu Leu Gly Gln Trp Lys Thr Glu Ile Glu Met His Ala
500 505 510

Lys Pro Gly Ser Leu Ser Val Tyr Val His Tyr Gly Gln Ser Arg Pro
515 520 525

Lys Asp Ala Lys Leu Leu Ser Gln Ser Asp Val Val Ile Thr Thr Tyr
530 535 540

Gly Val Leu Thr Ser Glu Phe Ser Gln Glu Asn Ser Ala Asp His Glu
545 550 555 560

Gly Ile Tyr Ala Val Arg Trp Phe Arg Ile Val Leu Asp Glu Ala His
565 570 575

Thr Ile Lys Asn Ser Lys Ser Gln Ile Ser Leu Ala Ala Ala Ala Leu
580 585 590

Val Ala Asp Arg Arg Trp Cys Leu Thr Gly Thr Pro Ile Gln Asn Asn

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595 600 605

Leu Glu Asp Leu Tyr Ser Leu Leu Arg Phe Leu Arg Ile Glu Pro Trp
610 615 620

Gly Thr Trp Ala Trp Trp Asn Lys Leu Val Gln Lys Pro Phe Glu Glu
625 630 635 640

Gly Asp Glu Arg Gly Leu Lys Leu Val Gln Ser Ile Leu Lys Pro Ile
645 650 655

Met Leu Arg Arg Thr Lys Ser Ser Thr Asp Arg Glu Gly Arg Pro Ile
660 665 670

Leu Val Leu Pro Pro Ala Asp Ala Arg Val Ile Tyr Cys Glu Leu Ser
675 680 685

Glu Ser Glu Arg Asp Phe Tyr Asp Ala Leu Phe Lys Arg Ser Lys Val
690 695 700

Lys Phe Asp Gln Phe Val Glu Gln Gly Lys Val Leu His Asn Tyr Ala
705 710 715 720

Ser Ile Leu Glu Leu Leu Leu Arg Leu Arg Gln Cys Cys Asp His Pro
725 730 735

Phe Leu Val Met Ser Arg Gly Asp Thr Ala Glu Tyr Ser Asp Leu Asn
740 745 750

Lys Leu Ser Lys Arg Phe Leu Ser Gly Lys Ser Ser Gly Leu Glu Arg
755 760 765

Glu Gly Lys Asp Val Pro Ser Glu Ala Phe Val Gln Glu Val Val Glu
770 775 780

Glu Leu Arg Lys Gly Glu Gln Gly Glu Cys Pro Ile Cys Leu Glu Ala
785 790 795 800

Leu Glu Asp Ala Val Leu Thr Pro Cys Ala His Arg Leu Cys Arg Glu
805 810 815

Cys Leu Leu Ala Ser Trp Arg Asn Ser Thr Ser Gly Leu Cys Pro Val
820 825 830

Cys Arg Asn Thr Val Ser Lys Gln Glu Leu Ile Thr Ala Pro Thr Glu
835 840 845

Ser Arg Phe Gln Val Asp Val Glu Lys Asn Trp Val Glu Ser Ser Lys
850 855 860

Ile Thr Ala Leu Leu Glu Glu Leu Glu Gly Leu Arg Ser Ser Gly Ser
865 870 875 880

Lys Ser Ile Leu Phe Ser Gln Trp Thr Ala Phe Leu Asp Leu Leu Gln
885 890 895

Ile Pro Leu Ser Arg Asn Asn Phe Ser Phe Val Arg Leu Asp Gly Thr
900 905 910

Leu Ser Gln Gln Gln Arg Glu Lys Val Leu Lys Glu Phe Ser Glu Asp
915 920 925

Gly Ser Ile Leu Val Leu Leu Met Ser Leu Lys Ala Gly Gly Val Gly
930 935 940

Ile Asn Leu Thr Ala Ala Ser Asn Ala Phe Val Met Asp Pro Trp Trp
945 950 955 960

Asn Pro Ala Val Glu Glu Gln Ala Val Met Arg Ile His Arg Ile Gly
965 970 975

Gln Thr Lys Glu Val Lys Ile Arg Arg Phe Ile Val Lys Gly Thr Val
980 985 990

Glu Glu Arg Met Glu Ala Val Gln Ala Arg Lys Gln Arg Met Ile Ser
995 1000 1005

Gly Ala Leu Thr Asp Gln Glu Val Arg Ser Ala Arg Ile Glu Glu
1010 1015 1020

Leu Lys Met Leu Phe Thr
1025

<210> 237 <211> 783 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(783) <223> G1537

<400> 237

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atg gaa aac gaa gta aac gca gga aca gca agc agt tca aga tgg aac       48
Met Glu Asn Glu Val Asn Ala Gly Thr Ala Ser Ser Ser Arg Trp Asn
1               5                   10                  15

cca acg aaa gat cag atc acg cta ctg gaa aat ctt tac aag gaa gga       96
Pro Thr Lys Asp Gln Ile Thr Leu Leu Glu Asn Leu Tyr Lys Glu Gly
            20                  25                  30

ata cga act ccg agc gcc gat cag att cag cag atc acc ggt agg ctt      144
Ile Arg Thr Pro Ser Ala Asp Gln Ile Gln Gln Ile Thr Gly Arg Leu
        35                  40                  45

cgt gcg tac ggc cat atc gaa ggt aaa aac gtc ttt tac tgg ttc cag      192
Arg Ala Tyr Gly His Ile Glu Gly Lys Asn Val Phe Tyr Trp Phe Gln
    50                  55                  60

aac cat aag gct agg caa cgc caa aag cag aaa cag gag cgc atg gct      240
Asn His Lys Ala Arg Gln Arg Gln Lys Gln Lys Gln Glu Arg Met Ala
65                  70                  75                  80

tac ttc aat cgc ctc ctc cac aaa acc tcc cgt ttc ttc tac ccc cct      288
Tyr Phe Asn Arg Leu Leu His Lys Thr Ser Arg Phe Phe Tyr Pro Pro
                85                  90                  95

cct tgc tca aac gtg ggt tgt gtc agt ccg tac tat tta cag caa gca      336
Pro Cys Ser Asn Val Gly Cys Val Ser Pro Tyr Tyr Leu Gln Gln Ala
            100                 105                 110

agt gat cat cat atg aat caa cat gga agt gta tac aca aac gat ctt      384
Ser Asp His His Met Asn Gln His Gly Ser Val Tyr Thr Asn Asp Leu
        115                 120                 125

ctt cac aga aac aat gtg atg att cca agt ggt ggc tac gag aaa cgg      432
Leu His Arg Asn Asn Val Met Ile Pro Ser Gly Gly Tyr Glu Lys Arg
    130                 135                 140

aca gtc aca caa cat cag aaa caa ctt tca gac ata aga aca aca gca      480
Thr Val Thr Gln His Gln Lys Gln Leu Ser Asp Ile Arg Thr Thr Ala
145                 150                 155                 160

gcc aca aga atg cca att tct ccg agt tca ctc aga ttt gac aga ttt      528
Ala Thr Arg Met Pro Ile Ser Pro Ser Ser Leu Arg Phe Asp Arg Phe
                165                 170                 175

gcc ctc cgt gat aac tgt tat gcc ggt gag gac att aac gtc aat tcc      576
Ala Leu Arg Asp Asn Cys Tyr Ala Gly Glu Asp Ile Asn Val Asn Ser
            180                 185                 190

agt gga cgg aaa aca ctc cct ctt ttt cct ctt cag cct ttg aat gca      624
Ser Gly Arg Lys Thr Leu Pro Leu Phe Pro Leu Gln Pro Leu Asn Ala
        195                 200                 205

agt aat gct gat ggt atg gga agt tcc agt ttt gcc ctt ggt agt gat      672
Ser Asn Ala Asp Gly Met Gly Ser Ser Ser Phe Ala Leu Gly Ser Asp
    210                 215                 220
```

```
tct ccg gtg gat tgt tct agc gat gga gcc ggc cga gag cag ccg ttt      720
Ser Pro Val Asp Cys Ser Ser Asp Gly Ala Gly Arg Glu Gln Pro Phe
225                 230                 235                 240

att gat ttc ttt tct ggt ggt tct act tct act cgt ttc gat agt aat      768
Ile Asp Phe Phe Ser Gly Gly Ser Thr Ser Thr Arg Phe Asp Ser Asn
                245                 250                 255

ggt aat ggg ttg taa                                                  783
Gly Asn Gly Leu
            260
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<210> 238 <211> 260 <212> PRT <213> Arabidopsis thaliana <400> 238

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Met Glu Asn Glu Val Asn Ala Gly Thr Ala Ser Ser Ser Arg Trp Asn
1               5                   10                  15

Pro Thr Lys Asp Gln Ile Thr Leu Leu Glu Asn Leu Tyr Lys Glu Gly
            20                  25                  30

Ile Arg Thr Pro Ser Ala Asp Gln Ile Gln Gln Ile Thr Gly Arg Leu
        35                  40                  45

Arg Ala Tyr Gly His Ile Glu Gly Lys Asn Val Phe Tyr Trp Phe Gln
    50                  55                  60

Asn His Lys Ala Arg Gln Arg Gln Lys Gln Lys Gln Glu Arg Met Ala
65                  70                  75                  80

Tyr Phe Asn Arg Leu Leu His Lys Thr Ser Arg Phe Phe Tyr Pro Pro
                85                  90                  95

Pro Cys Ser Asn Val Gly Cys Val Ser Pro Tyr Tyr Leu Gln Gln Ala
            100                 105                 110

Ser Asp His His Met Asn Gln His Gly Ser Val Tyr Thr Asn Asp Leu
        115                 120                 125

Leu His Arg Asn Asn Val Met Ile Pro Ser Gly Gly Tyr Glu Lys Arg
    130                 135                 140

Thr Val Thr Gln His Gln Lys Gln Leu Ser Asp Ile Arg Thr Thr Ala
145                 150                 155                 160

Ala Thr Arg Met Pro Ile Ser Pro Ser Ser Leu Arg Phe Asp Arg Phe
                165                 170                 175
```

```
Ala Leu Arg Asp Asn Cys Tyr Ala Gly Glu Asp Ile Asn Val Asn Ser
            180                 185                 190

Ser Gly Arg Lys Thr Leu Pro Leu Phe Pro Leu Gln Pro Leu Asn Ala
        195                 200                 205

Ser Asn Ala Asp Gly Met Gly Ser Ser Ser Phe Ala Leu Gly Ser Asp
    210                 215                 220

Ser Pro Val Asp Cys Ser Ser Asp Gly Ala Gly Arg Glu Gln Pro Phe
225                 230                 235                 240

Ile Asp Phe Phe Ser Gly Gly Ser Thr Ser Thr Arg Phe Asp Ser Asn
                245                 250                 255

Gly Asn Gly Leu
            260
```

<210> 239 <211> 828 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(828) <223> G1543

<400> 239

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atg ata aaa cta cta ttt acg tac ata tgc aca tac aca tat aaa cta       48
Met Ile Lys Leu Leu Phe Thr Tyr Ile Cys Thr Tyr Thr Tyr Lys Leu
1               5                   10                  15

tat gct cta tat cat atg gat tac gca tgc gtg tgt atg tat aaa tat       96
Tyr Ala Leu Tyr His Met Asp Tyr Ala Cys Val Cys Met Tyr Lys Tyr
            20                  25                  30

aaa ggc atc gtc acg ctt caa gtt tgt ctc ttt tat att aaa ctg aga      144
Lys Gly Ile Val Thr Leu Gln Val Cys Leu Phe Tyr Ile Lys Leu Arg
        35                  40                  45

gtt ttc ctc tca aac ttt acc ttt tct tct tcg atc cta gct ctt aag      192
Val Phe Leu Ser Asn Phe Thr Phe Ser Ser Ser Ile Leu Ala Leu Lys
    50                  55                  60

aac cct aat aat tca ttg atc aaa ata atg gcg att ttg ccg gaa aac      240
Asn Pro Asn Asn Ser Leu Ile Lys Ile Met Ala Ile Leu Pro Glu Asn
65                  70                  75                  80

tct tca aac ttg gat ctt act atc tcc gtt cca ggc ttc tct tca tcc      288
Ser Ser Asn Leu Asp Leu Thr Ile Ser Val Pro Gly Phe Ser Ser Ser
                85                  90                  95

cct ctc tcc gat gaa gga agt ggc gga gga aga gac cag cta agg cta      336
Pro Leu Ser Asp Glu Gly Ser Gly Gly Gly Arg Asp Gln Leu Arg Leu
            100                 105                 110
```

```
gac atg aat cgg tta ccg tcg tct gaa gac gga gac gat gaa gaa ttc      384
Asp Met Asn Arg Leu Pro Ser Ser Glu Asp Gly Asp Asp Glu Glu Phe
        115                 120                 125

agt cac gat gat ggc tct gct cct ccg cga aag aaa ctc cgt cta acc      432
Ser His Asp Asp Gly Ser Ala Pro Pro Arg Lys Lys Leu Arg Leu Thr
    130                 135                 140

aga gaa cag tca cgt ctt ctt gaa gat agt ttc aga cag aat cat acc      480
Arg Glu Gln Ser Arg Leu Leu Glu Asp Ser Phe Arg Gln Asn His Thr
145                 150                 155                 160

ctt aat ccc aaa caa aag gaa gta ctt gcc aag cat ttg atg cta cgg      528
Leu Asn Pro Lys Gln Lys Glu Val Leu Ala Lys His Leu Met Leu Arg
                165                 170                 175

cca aga caa att gaa gtt tgg ttt caa aac cgt aga gca agg agc aaa      576
Pro Arg Gln Ile Glu Val Trp Phe Gln Asn Arg Arg Ala Arg Ser Lys
            180                 185                 190

ttg aag caa acc gag atg gaa tgc gag tat ctc aaa agg tgg ttt ggt      624
Leu Lys Gln Thr Glu Met Glu Cys Glu Tyr Leu Lys Arg Trp Phe Gly
        195                 200                 205

tca tta acg gaa gaa aac cac agg ctc cat aga gaa gta gaa gag ctt      672
Ser Leu Thr Glu Glu Asn His Arg Leu His Arg Glu Val Glu Glu Leu
    210                 215                 220

aga gcc ata aag gtt ggc cca aca acg gtg aac tct gcc tcg agc ctt      720
Arg Ala Ile Lys Val Gly Pro Thr Thr Val Asn Ser Ala Ser Ser Leu
225                 230                 235                 240

act atg tgt cct cgc tgc gag cga gtt acc cct gcc gcg agc cct tcg      768
Thr Met Cys Pro Arg Cys Glu Arg Val Thr Pro Ala Ala Ser Pro Ser
                245                 250                 255

agg gcg gtg gtg ccg gtt ccg gct aag aaa acg ttt ccg ccg caa gag      816
Arg Ala Val Val Pro Val Pro Ala Lys Lys Thr Phe Pro Pro Gln Glu
            260                 265                 270

cgt gat cgt tga                                                     828
Arg Asp Arg
        275
```

<210> 240 <211> 275 <212> PRT <213> Arabidopsis thaliana <400> 240

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Met Ile Lys Leu Leu Phe Thr Tyr Ile Cys Thr Tyr Thr Tyr Lys Leu
1               5                   10                  15

Tyr Ala Leu Tyr His Met Asp Tyr Ala Cys Val Cys Met Tyr Lys Tyr
            20                  25                  30

Lys Gly Ile Val Thr Leu Gln Val Cys Leu Phe Tyr Ile Lys Leu Arg
```

Replacement Sheet

```
        35                  40                  45

Val Phe Leu Ser Asn Phe Thr Phe Ser Ser Ser Ile Leu Ala Leu Lys
    50                  55                  60

Asn Pro Asn Asn Ser Leu Ile Lys Ile Met Ala Ile Leu Pro Glu Asn
65                  70                  75                  80

Ser Ser Asn Leu Asp Leu Thr Ile Ser Val Pro Gly Phe Ser Ser Ser
                85                  90                  95

Pro Leu Ser Asp Glu Gly Ser Gly Gly Gly Arg Asp Gln Leu Arg Leu
            100                 105                 110

Asp Met Asn Arg Leu Pro Ser Ser Glu Asp Gly Asp Asp Glu Glu Phe
        115                 120                 125

Ser His Asp Asp Gly Ser Ala Pro Pro Arg Lys Lys Leu Arg Leu Thr
    130                 135                 140

Arg Glu Gln Ser Arg Leu Leu Glu Asp Ser Phe Arg Gln Asn His Thr
145                 150                 155                 160

Leu Asn Pro Lys Gln Lys Glu Val Leu Ala Lys His Leu Met Leu Arg
                165                 170                 175

Pro Arg Gln Ile Glu Val Trp Phe Gln Asn Arg Arg Ala Arg Ser Lys
            180                 185                 190

Leu Lys Gln Thr Glu Met Glu Cys Glu Tyr Leu Lys Arg Trp Phe Gly
        195                 200                 205

Ser Leu Thr Glu Glu Asn His Arg Leu His Arg Glu Val Glu Glu Leu
    210                 215                 220

Arg Ala Ile Lys Val Gly Pro Thr Thr Val Asn Ser Ala Ser Ser Leu
225                 230                 235                 240

Thr Met Cys Pro Arg Cys Glu Arg Val Thr Pro Ala Ala Ser Pro Ser
                245                 250                 255

Arg Ala Val Val Pro Val Pro Ala Lys Lys Thr Phe Pro Pro Gln Glu
            260                 265                 270
```

Arg Asp Arg
275

<210> 241 <211> 1962 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1962) <223> G1574

<400> 241

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Met Asp Asp Thr Met Asp Met Ser Ser Gly Ser Asp Glu Glu Val Gln
1               5                  10                  15

gaa gag aag acc act gtt aac gag agg gtc atc tat cag gct gca tta      96
Glu Glu Lys Thr Thr Val Asn Glu Arg Val Ile Tyr Gln Ala Ala Leu
            20                  25                  30

caa gat ctg aag caa ccc aag acc gaa aag gat cta cct cct ggt gtt     144
Gln Asp Leu Lys Gln Pro Lys Thr Glu Lys Asp Leu Pro Pro Gly Val
        35                  40                  45

ctt aca gtt cct ctt atg agg cat cag aaa att gca ttg aac tgg atg     192
Leu Thr Val Pro Leu Met Arg His Gln Lys Ile Ala Leu Asn Trp Met
    50                  55                  60

cgt aag aaa gaa aaa aga agc agg cac tgt ttg gga ggg ata tta gca     240
Arg Lys Lys Glu Lys Arg Ser Arg His Cys Leu Gly Gly Ile Leu Ala
65                  70                  75                  80

gat gat cag gga ctt ggt aaa acg atc tcg acg atc tct ctt atc ctg     288
Asp Asp Gln Gly Leu Gly Lys Thr Ile Ser Thr Ile Ser Leu Ile Leu
                85                  90                  95

tta caa aag ttg aag tca caa tca aag cag aga aag cga aaa ggt caa     336
Leu Gln Lys Leu Lys Ser Gln Ser Lys Gln Arg Lys Arg Lys Gly Gln
            100                 105                 110

aac tct ggt ggt aca ttg att gtt tgt cca gca agt gtt gta aaa caa     384
Asn Ser Gly Gly Thr Leu Ile Val Cys Pro Ala Ser Val Val Lys Gln
        115                 120                 125

tgg gca aga gaa gtt aaa gag aag gtt tct gat gaa cac aaa ctc tct     432
Trp Ala Arg Glu Val Lys Glu Lys Val Ser Asp Glu His Lys Leu Ser
    130                 135                 140

gtt tta gtc cac cat gga tct cac aga acc aaa gat cca aca gaa ata     480
Val Leu Val His His Gly Ser His Arg Thr Lys Asp Pro Thr Glu Ile
145                 150                 155                 160

gca ata tat gat gtg gtc atg aca act tac gcc att gtt aca aat gaa     528
Ala Ile Tyr Asp Val Val Met Thr Thr Tyr Ala Ile Val Thr Asn Glu
                165                 170                 175

gtt cca caa aac cct atg ctg aat cgt tat gat agt atg aga ggc aga     576
Val Pro Gln Asn Pro Met Leu Asn Arg Tyr Asp Ser Met Arg Gly Arg
            180                 185                 190
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gaa agc ctt gac gga tcg agt ttg att cag cct cac gtt ggt gca cta      624
Glu Ser Leu Asp Gly Ser Ser Leu Ile Gln Pro His Val Gly Ala Leu
        195                 200                 205

gga aga gtt agg tgg ttg aga gta gta tta gat gaa gct cat aca att      672
Gly Arg Val Arg Trp Leu Arg Val Val Leu Asp Glu Ala His Thr Ile
    210                 215                 220

aaa aac cat aga acc cta att gca aaa gct tgt ttt agc ctt aga gcc      720
Lys Asn His Arg Thr Leu Ile Ala Lys Ala Cys Phe Ser Leu Arg Ala
225                 230                 235                 240

aaa agg aga tgg tgt ttg act gga acg ccg ata aag aac aaa gta gac      768
Lys Arg Arg Trp Cys Leu Thr Gly Thr Pro Ile Lys Asn Lys Val Asp
                245                 250                 255

gat ctt tat agc tat ttc aga ttt ctt aga tat cat cca tat gcc atg      816
Asp Leu Tyr Ser Tyr Phe Arg Phe Leu Arg Tyr His Pro Tyr Ala Met
            260                 265                 270

tgc aat tca ttt cac caa aga atc aaa gct cca att gat aaa aag cct      864
Cys Asn Ser Phe His Gln Arg Ile Lys Ala Pro Ile Asp Lys Lys Pro
        275                 280                 285

ctt cat ggt tac aag aag ctt caa gct att cta agg ggt ata atg ttg      912
Leu His Gly Tyr Lys Lys Leu Gln Ala Ile Leu Arg Gly Ile Met Leu
    290                 295                 300

cgc cgc acc aaa gaa tgg tct ttc tac agg aag ctt gaa ttg aat tca      960
Arg Arg Thr Lys Glu Trp Ser Phe Tyr Arg Lys Leu Glu Leu Asn Ser
305                 310                 315                 320

cgt tgg aag ttt gag gaa tat gct gct gat ggg act ttg cat gaa cac     1008
Arg Trp Lys Phe Glu Glu Tyr Ala Ala Asp Gly Thr Leu His Glu His
                325                 330                 335

atg gct tat ctt ttg gtg atg ctt ttg cga cta cgc caa gct tgt aac     1056
Met Ala Tyr Leu Leu Val Met Leu Leu Arg Leu Arg Gln Ala Cys Asn
            340                 345                 350

cat cca caa ctt gtt aac gga tat agt cac tca gat act aca aga aaa     1104
His Pro Gln Leu Val Asn Gly Tyr Ser His Ser Asp Thr Thr Arg Lys
        355                 360                 365

atg tca gat gga gtt cga gta gcc cct aga gag aat cta atc atg ttc     1152
Met Ser Asp Gly Val Arg Val Ala Pro Arg Glu Asn Leu Ile Met Phe
    370                 375                 380

ctc gat ctc ttg aaa tta tcc tca acc acc tgc tct gtt tgt agt gat     1200
Leu Asp Leu Leu Lys Leu Ser Ser Thr Thr Cys Ser Val Cys Ser Asp
385                 390                 395                 400

cca cca aaa gac cct gtt gtt act ttg tgt ggc cat gtg ttt tgt tat     1248
Pro Pro Lys Asp Pro Val Val Thr Leu Cys Gly His Val Phe Cys Tyr
                405                 410                 415
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gag tgt gtg tct gta aac att aac ggg gat aac aat acg tgc cct gca      1296
Glu Cys Val Ser Val Asn Ile Asn Gly Asp Asn Asn Thr Cys Pro Ala
            420                 425                 430

ctt aat tgc cac agc cag ctt aaa cat gat gtt gtt ttc act gaa tct      1344
Leu Asn Cys His Ser Gln Leu Lys His Asp Val Val Phe Thr Glu Ser
        435                 440                 445

gca gtt aga agt tgc atc aac gat tat gat gat cct gaa gat aaa aat      1392
Ala Val Arg Ser Cys Ile Asn Asp Tyr Asp Asp Pro Glu Asp Lys Asn
    450                 455                 460

gct tta gtt gca tca agg cga gtt tat ttc atc gaa aat ccg agc tgt      1440
Ala Leu Val Ala Ser Arg Arg Val Tyr Phe Ile Glu Asn Pro Ser Cys
465                 470                 475                 480

gat aga gat tct tca gtc gct tgc aga gca agg cag tcc aga cac tcc      1488
Asp Arg Asp Ser Ser Val Ala Cys Arg Ala Arg Gln Ser Arg His Ser
                485                 490                 495

acc aat aaa gac aat agt atc agt gga ctg aat ctc att ttt acg ttt      1536
Thr Asn Lys Asp Asn Ser Ile Ser Gly Leu Asn Leu Ile Phe Thr Phe
            500                 505                 510

ctc aaa gac aaa tgt aat gat tat gaa aca ggt gcg atg ttg atg tct      1584
Leu Lys Asp Lys Cys Asn Asp Tyr Glu Thr Gly Ala Met Leu Met Ser
        515                 520                 525

ctt aaa gct gga aac ctt gga ttg aat atg gta gct gca agt cat gtc      1632
Leu Lys Ala Gly Asn Leu Gly Leu Asn Met Val Ala Ala Ser His Val
    530                 535                 540

att cta ctg gac cta tgg tgg aat cca aca aca gag gat caa gct att      1680
Ile Leu Leu Asp Leu Trp Trp Asn Pro Thr Thr Glu Asp Gln Ala Ile
545                 550                 555                 560

gat cga gct cat cgt atc gga caa act cga gct gtt acg gtc act cgt      1728
Asp Arg Ala His Arg Ile Gly Gln Thr Arg Ala Val Thr Val Thr Arg
                565                 570                 575

att gcc atc aaa aat acc gtt gag gaa cga att ttg act ctt cat gaa      1776
Ile Ala Ile Lys Asn Thr Val Glu Glu Arg Ile Leu Thr Leu His Glu
            580                 585                 590

cgt aaa agg aac att gtt gca tct gca ttg ggt gaa aaa aac tgg caa      1824
Arg Lys Arg Asn Ile Val Ala Ser Ala Leu Gly Glu Lys Asn Trp Gln
        595                 600                 605

aag ttc tgc gat tca act aac act aga aga tct cga ata tct gtt ttt      1872
Lys Phe Cys Asp Ser Thr Asn Thr Arg Arg Ser Arg Ile Ser Val Phe
    610                 615                 620

tgg tgt gta gaa tat ccc aga gtt ttt att gat aag agg aat aaa acc      1920
Trp Cys Val Glu Tyr Pro Arg Val Phe Ile Asp Lys Arg Asn Lys Thr
625                 630                 635                 640

ttt agc tat tta ata agt cac aag tgt gaa tgt aat gaa taa              1962
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09302005.030702

Phe Ser Tyr Leu Ile Ser His Lys Cys Glu Cys Asn Glu
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Gln Asp Leu Lys Gln Pro Lys Thr Glu Lys Asp Leu Pro Pro Gly Val
35 40 45

Leu Thr Val Pro Leu Met Arg His Gln Lys Ile Ala Leu Asn Trp Met
50 55 60

Arg Lys Lys Glu Lys Arg Ser Arg His Cys Leu Gly Gly Ile Leu Ala
65 70 75 80

Asp Asp Gln Gly Leu Gly Lys Thr Ile Ser Thr Ile Ser Leu Ile Leu
85 90 95

Leu Gln Lys Leu Lys Ser Gln Ser Lys Gln Arg Lys Arg Lys Gly Gln
100 105 110

Asn Ser Gly Gly Thr Leu Ile Val Cys Pro Ala Ser Val Val Lys Gln
115 120 125

Trp Ala Arg Glu Val Lys Glu Lys Val Ser Asp Glu His Lys Leu Ser
130 135 140

Val Leu Val His His Gly Ser His Arg Thr Lys Asp Pro Thr Glu Ile
145 150 155 160

Ala Ile Tyr Asp Val Val Met Thr Thr Tyr Ala Ile Val Thr Asn Glu
165 170 175

Val Pro Gln Asn Pro Met Leu Asn Arg Tyr Asp Ser Met Arg Gly Arg
180 185 190

Glu Ser Leu Asp Gly Ser Ser Leu Ile Gln Pro His Val Gly Ala Leu
195 200 205

Gly Arg Val Arg Trp Leu Arg Val Val Leu Asp Glu Ala His Thr Ile
210 215 220

Lys Asn His Arg Thr Leu Ile Ala Lys Ala Cys Phe Ser Leu Arg Ala
225 230 235 240

Lys Arg Arg Trp Cys Leu Thr Gly Thr Pro Ile Lys Asn Lys Val Asp
245 250 255

Asp Leu Tyr Ser Tyr Phe Arg Phe Leu Arg Tyr His Pro Tyr Ala Met
260 265 270

Cys Asn Ser Phe His Gln Arg Ile Lys Ala Pro Ile Asp Lys Lys Pro
275 280 285

Leu His Gly Tyr Lys Lys Leu Gln Ala Ile Leu Arg Gly Ile Met Leu
290 295 300

Arg Arg Thr Lys Glu Trp Ser Phe Tyr Arg Lys Leu Glu Leu Asn Ser
305 310 315 320

Arg Trp Lys Phe Glu Glu Tyr Ala Ala Asp Gly Thr Leu His Glu His
325 330 335

Met Ala Tyr Leu Leu Val Met Leu Leu Arg Leu Arg Gln Ala Cys Asn
340 345 350

His Pro Gln Leu Val Asn Gly Tyr Ser His Ser Asp Thr Thr Arg Lys
355 360 365

Met Ser Asp Gly Val Arg Val Ala Pro Arg Glu Asn Leu Ile Met Phe
370 375 380

Leu Asp Leu Leu Lys Leu Ser Ser Thr Thr Cys Ser Val Cys Ser Asp
385 390 395 400

Pro Pro Lys Asp Pro Val Val Thr Leu Cys Gly His Val Phe Cys Tyr
405 410 415

Glu Cys Val Ser Val Asn Ile Asn Gly Asp Asn Asn Thr Cys Pro Ala
420 425 430

Leu Asn Cys His Ser Gln Leu Lys His Asp Val Val Phe Thr Glu Ser
435 440 445

Ala Val Arg Ser Cys Ile Asn Asp Tyr Asp Asp Pro Glu Asp Lys Asn
450 455 460

Ala Leu Val Ala Ser Arg Arg Val Tyr Phe Ile Glu Asn Pro Ser Cys
465 470 475 480

Asp Arg Asp Ser Ser Val Ala Cys Arg Ala Arg Gln Ser Arg His Ser
485 490 495

Thr Asn Lys Asp Asn Ser Ile Ser Gly Leu Asn Leu Ile Phe Thr Phe
500 505 510

Leu Lys Asp Lys Cys Asn Asp Tyr Glu Thr Gly Ala Met Leu Met Ser
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Leu Lys Ala Gly Asn Leu Gly Leu Asn Met Val Ala Ala Ser His Val
530 535 540

Ile Leu Leu Asp Leu Trp Trp Asn Pro Thr Thr Glu Asp Gln Ala Ile
545 550 555 560

Asp Arg Ala His Arg Ile Gly Gln Thr Arg Ala Val Thr Val Thr Arg
565 570 575

Ile Ala Ile Lys Asn Thr Val Glu Glu Arg Ile Leu Thr Leu His Glu
580 585 590

Arg Lys Arg Asn Ile Val Ala Ser Ala Leu Gly Glu Lys Asn Trp Gln
595 600 605

Lys Phe Cys Asp Ser Thr Asn Thr Arg Arg Ser Arg Ile Ser Val Phe
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cca gtc cgg gca cgt tgg tca cct aaa ccg gag caa atc ttg ata ctc       96
Pro Val Arg Ala Arg Trp Ser Pro Lys Pro Glu Gln Ile Leu Ile Leu
            20                  25                  30

gaa tcc atc ttc aac agt ggt act gtt aac cca cca aaa gat gaa acg      144
Glu Ser Ile Phe Asn Ser Gly Thr Val Asn Pro Pro Lys Asp Glu Thr
        35                  40                  45

gtg agg ata aga aag atg ctt gag aaa ttc ggt gct gtg gga gac gca      192
Val Arg Ile Arg Lys Met Leu Glu Lys Phe Gly Ala Val Gly Asp Ala
    50                  55                  60

aac gtc ttc tac tgg ttt caa aac cga cgg tca aga tct cgc cgg aga      240
Asn Val Phe Tyr Trp Phe Gln Asn Arg Arg Ser Arg Ser Arg Arg Arg
65                  70                  75                  80

cac cgg cag ctt tta gca gcc acc acc gca gcc gcc acc tcc ata gga      288
His Arg Gln Leu Leu Ala Ala Thr Thr Ala Ala Ala Thr Ser Ile Gly
                85                  90                  95

gct gaa gac cac cag cac atg acg gcc atg agc atg cat caa tat cct      336
Ala Glu Asp His Gln His Met Thr Ala Met Ser Met His Gln Tyr Pro
            100                 105                 110

tgc agc aac aac gag att gat ttg ggg ttt gga agt tgt agc aac tta      384
Cys Ser Asn Asn Glu Ile Asp Leu Gly Phe Gly Ser Cys Ser Asn Leu
        115                 120                 125

tca gct aat tac ttc ctt aat gga tcg tcg tca tct caa atc cct tcc      432
Ser Ala Asn Tyr Phe Leu Asn Gly Ser Ser Ser Ser Gln Ile Pro Ser
    130                 135                 140

ttt ttc ctc ggc ctc tct tct tca agt ggt ggg tgt gag aac aac aat      480
Phe Phe Leu Gly Leu Ser Ser Ser Ser Gly Gly Cys Glu Asn Asn Asn
145                 150                 155                 160

ggt atg gag aat ctc ttc aaa atg tat ggc cat gaa tct gat cat aat      528
Gly Met Glu Asn Leu Phe Lys Met Tyr Gly His Glu Ser Asp His Asn
                165                 170                 175

cat cag cag cag cat cat agc tca aat gct gca tca gtt tta aac cca      576
His Gln Gln Gln His His Ser Ser Asn Ala Ala Ser Val Leu Asn Pro
            180                 185                 190

tct gat caa aac tcc aac tcc caa tac gaa caa gaa ggg ttt atg acg      624
Ser Asp Gln Asn Ser Asn Ser Gln Tyr Glu Gln Glu Gly Phe Met Thr
        195                 200                 205

gtg ttt ata aac gga gtt cct atg gaa gta aca aaa gga gca ata gac      672
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Val Phe Ile Asn Gly Val Pro Met Glu Val Thr Lys Gly Ala Ile Asp
    210                 215                 220

atg aaa aca atg ttc ggt gat gat tcg gtg tta ctt cat tcc tct ggt      720
Met Lys Thr Met Phe Gly Asp Asp Ser Val Leu Leu His Ser Ser Gly
225                 230                 235                 240

ctt cct ctt ccc act gat gag ttt ggt ttc ttg atg cat tct tta caa      768
Leu Pro Leu Pro Thr Asp Glu Phe Gly Phe Leu Met His Ser Leu Gln
                245                 250                 255

cat gga caa act tat ttc ctg gta ccg aga cag aca tga                  807
His Gly Gln Thr Tyr Phe Leu Val Pro Arg Gln Thr
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Met Asn Gln Glu Gly Ala Ser His Ser Pro Ser Ser Thr Ser Thr Glu
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Pro Val Arg Ala Arg Trp Ser Pro Lys Pro Glu Gln Ile Leu Ile Leu
            20                  25                  30

Glu Ser Ile Phe Asn Ser Gly Thr Val Asn Pro Pro Lys Asp Glu Thr
        35                  40                  45

Val Arg Ile Arg Lys Met Leu Glu Lys Phe Gly Ala Val Gly Asp Ala
    50                  55                  60

Asn Val Phe Tyr Trp Phe Gln Asn Arg Arg Ser Arg Ser Arg Arg Arg
65                  70                  75                  80

His Arg Gln Leu Leu Ala Ala Thr Thr Ala Ala Ala Thr Ser Ile Gly
                85                  90                  95

Ala Glu Asp His Gln His Met Thr Ala Met Ser Met His Gln Tyr Pro
            100                 105                 110

Cys Ser Asn Asn Glu Ile Asp Leu Gly Phe Gly Ser Cys Ser Asn Leu
        115                 120                 125

Ser Ala Asn Tyr Phe Leu Asn Gly Ser Ser Ser Ser Gln Ile Pro Ser
    130                 135                 140

Phe Phe Leu Gly Leu Ser Ser Ser Ser Gly Gly Cys Glu Asn Asn Asn
145                 150                 155                 160
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Gly Met Glu Asn Leu Phe Lys Met Tyr Gly His Glu Ser Asp His Asn
165 170 175

His Gln Gln Gln His His Ser Ser Asn Ala Ala Ser Val Leu Asn Pro
180 185 190

Ser Asp Gln Asn Ser Asn Ser Gln Tyr Glu Gln Glu Gly Phe Met Thr
195 200 205

Val Phe Ile Asn Gly Val Pro Met Glu Val Thr Lys Gly Ala Ile Asp
210 215 220

Met Lys Thr Met Phe Gly Asp Asp Ser Val Leu Leu His Ser Ser Gly
225 230 235 240

Leu Pro Leu Pro Thr Asp Glu Phe Gly Phe Leu Met His Ser Leu Gln
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His Gly Gln Thr Tyr Phe Leu Val Pro Arg Gln Thr
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Val Pro Thr Ser Asp His Arg Phe Val Val Gln Glu Met Met Cys Leu
15 20 25

caa agc tcg agc tgg act aaa gaa gag aac aag aag ttt gag cga gct 147
Gln Ser Ser Ser Trp Thr Lys Glu Glu Asn Lys Lys Phe Glu Arg Ala
30 35 40

ctt gct gtc tac gct gat gac acg cct gat cgc tgg ttc aaa gtt gct 195
Leu Ala Val Tyr Ala Asp Asp Thr Pro Asp Arg Trp Phe Lys Val Ala
45 50 55

gct atg atc cct gga aag acc ata tca gat gtc atg agg caa tac tct 243
Ala Met Ile Pro Gly Lys Thr Ile Ser Asp Val Met Arg Gln Tyr Ser
60 65 70

aag ctt gaa gaa gac ctc ttc gat atc gaa gca gga ctt gtc ccg atc 291
Lys Leu Glu Glu Asp Leu Phe Asp Ile Glu Ala Gly Leu Val Pro Ile
75 80 85 90

ccg ggt tac cgt tca gtt act cct tgt gga ttt gat cag gtt gtg agt 339
Pro Gly Tyr Arg Ser Val Thr Pro Cys Gly Phe Asp Gln Val Val Ser
95 100 105

cca cgt gac ttt gat gcg tat cgt aaa ctt cct aat gga gcc aga gga 387
Pro Arg Asp Phe Asp Ala Tyr Arg Lys Leu Pro Asn Gly Ala Arg Gly
110 115 120

ttt gat caa gac cgt agg aaa gga gtt cca tgg acg gag gaa gaa cac 435
Phe Asp Gln Asp Arg Arg Lys Gly Val Pro Trp Thr Glu Glu Glu His
125 130 135

agg aga ttc ttg tta ggg ctt ctc aag tat ggg aaa gga gat tgg aga 483
Arg Arg Phe Leu Leu Gly Leu Leu Lys Tyr Gly Lys Gly Asp Trp Arg
140 145 150

aac ata tcg agg aac ttt gtg gga tca aaa aca cca act cag gtt gca 531
Asn Ile Ser Arg Asn Phe Val Gly Ser Lys Thr Pro Thr Gln Val Ala
155 160 165 170

agt cat gcc caa aag tac tac caa aga cag ctt tcc ggt gcg aaa gac 579
Ser His Ala Gln Lys Tyr Tyr Gln Arg Gln Leu Ser Gly Ala Lys Asp
175 180 185

aaa cga cgg cct agc att cac gac atc acc acc gtc aat ctt ctc aat 627
Lys Arg Arg Pro Ser Ile His Asp Ile Thr Thr Val Asn Leu Leu Asn
190 195 200

gcc aat ctt agc cgt cca tcg tct gat cac ggt tgc tta gtc tca aaa 675
Ala Asn Leu Ser Arg Pro Ser Ser Asp His Gly Cys Leu Val Ser Lys
205 210 215

cag gcc gag ccg aaa cta ggg ttc acc gac agg gat aat gca gag gag 723
Gln Ala Glu Pro Lys Leu Gly Phe Thr Asp Arg Asp Asn Ala Glu Glu
220 225 230

gga gtt atg ttt ctt ggt cag aat cta tcc tcg gtc ttc tct tcc tac 771
Gly Val Met Phe Leu Gly Gln Asn Leu Ser Ser Val Phe Ser Ser Tyr
235 240 245 250

gat cct gcc att aag ttt tcc gga gca aat gtt tac ggt gaa gga ggt 819
Asp Pro Ala Ile Lys Phe Ser Gly Ala Asn Val Tyr Gly Glu Gly Gly
255 260 265

tac tgt atc tca caa gat ctt gaa acg aga aaa tga gaattttgaa 865
Tyr Cys Ile Ser Gln Asp Leu Glu Thr Arg Lys
270 275

attttaacta ttgcaacgaa accataattg c 896

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Lys Glu Glu Asn Lys Lys Phe Glu Arg Ala Leu Ala Val Tyr Ala Asp
35 40 45

Asp Thr Pro Asp Arg Trp Phe Lys Val Ala Ala Met Ile Pro Gly Lys
50 55 60

Thr Ile Ser Asp Val Met Arg Gln Tyr Ser Lys Leu Glu Glu Asp Leu
65 70 75 80

Phe Asp Ile Glu Ala Gly Leu Val Pro Ile Pro Gly Tyr Arg Ser Val
85 90 95

Thr Pro Cys Gly Phe Asp Gln Val Val Ser Pro Arg Asp Phe Asp Ala
100 105 110

Tyr Arg Lys Leu Pro Asn Gly Ala Arg Gly Phe Asp Gln Asp Arg Arg
115 120 125

Lys Gly Val Pro Trp Thr Glu Glu Glu His Arg Arg Phe Leu Leu Gly
130 135 140

Leu Leu Lys Tyr Gly Lys Gly Asp Trp Arg Asn Ile Ser Arg Asn Phe
145 150 155 160

Val Gly Ser Lys Thr Pro Thr Gln Val Ala Ser His Ala Gln Lys Tyr
165 170 175

Tyr Gln Arg Gln Leu Ser Gly Ala Lys Asp Lys Arg Arg Pro Ser Ile
180 185 190

His Asp Ile Thr Thr Val Asn Leu Leu Asn Ala Asn Leu Ser Arg Pro
195 200 205

Ser Ser Asp His Gly Cys Leu Val Ser Lys Gln Ala Glu Pro Lys Leu
210 215 220

Gly Phe Thr Asp Arg Asp Asn Ala Glu Glu Gly Val Met Phe Leu Gly
225 230 235 240

Gln Asn Leu Ser Ser Val Phe Ser Ser Tyr Asp Pro Ala Ile Lys Phe

Replacement Page

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Ser Gly Ala Asn Val Tyr Gly Glu Gly Gly Tyr Cys Ile Ser Gln Asp
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Leu Glu Thr Arg Lys
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1               5                   10                  15

ttg agg aat aga gat gaa gaa act gca gac aag cag ata caa ttc aat       96
Leu Arg Asn Arg Asp Glu Glu Thr Ala Asp Lys Gln Ile Gln Phe Asn
            20                  25                  30

gac caa agt ttt ggg gga aat gac tat gca ccc aag gta cgg aag cca      144
Asp Gln Ser Phe Gly Gly Asn Asp Tyr Ala Pro Lys Val Arg Lys Pro
        35                  40                  45

tac acg ata aca aaa gag aga gag aga tgg aca gat gaa gag cac aag      192
Tyr Thr Ile Thr Lys Glu Arg Glu Arg Trp Thr Asp Glu Glu His Lys
    50                  55                  60

aag ttt gtt gaa gcc ttg aaa tta tac ggg cga gct tgg aga cga ata      240
Lys Phe Val Glu Ala Leu Lys Leu Tyr Gly Arg Ala Trp Arg Arg Ile
65                  70                  75                  80

gaa gaa cat gtg ggc tca aag acc gca gtt cag att cga agc cat gct      288
Glu Glu His Val Gly Ser Lys Thr Ala Val Gln Ile Arg Ser His Ala
                85                  90                  95

cag aag ttt ttc tct aag gtt gct cga gaa gca act gga ggt gat ggg      336
Gln Lys Phe Phe Ser Lys Val Ala Arg Glu Ala Thr Gly Gly Asp Gly
            100                 105                 110

agc tca gta gag ccg att gta ata cct cct cct cgt ccc aag aga aag      384
Ser Ser Val Glu Pro Ile Val Ile Pro Pro Pro Arg Pro Lys Arg Lys
        115                 120                 125

cca gcg cat ccg tac cct cgt aag ttt ggg aac gag gca gat caa aca      432
Pro Ala His Pro Tyr Pro Arg Lys Phe Gly Asn Glu Ala Asp Gln Thr
    130                 135                 140

agt aga tcg gtt tct ccc tca gaa cgt gat act caa tct cca acc tct      480
Ser Arg Ser Val Ser Pro Ser Glu Arg Asp Thr Gln Ser Pro Thr Ser
145                 150                 155                 160

gtg ttg tcc act gtt gga tca gaa gca ttg tgt tcc ctt gat tcg agt      528
Val Leu Ser Thr Val Gly Ser Glu Ala Leu Cys Ser Leu Asp Ser Ser
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Application - 09/2020

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                    165                 170                 175

tca ccc aat cga agc ttg tcc cca gtt tct tct gca tca cca cca gct      576
Ser Pro Asn Arg Ser Leu Ser Pro Val Ser Ser Ala Ser Pro Pro Ala
            180                 185                 190

gct ctt aca acc act gca aat gca cct gaa gag ctt gag act ctg aag      624
Ala Leu Thr Thr Thr Ala Asn Ala Pro Glu Glu Leu Glu Thr Leu Lys
        195                 200                 205

ctg gag ttg ttt cct agt gag aga ctc tta aac agg gag agc tcg atc      672
Leu Glu Leu Phe Pro Ser Glu Arg Leu Leu Asn Arg Glu Ser Ser Ile
    210                 215                 220

aag gaa cca acg aag caa agt ctt aaa ctc ttt ggg aag aca gtt ttg      720
Lys Glu Pro Thr Lys Gln Ser Leu Lys Leu Phe Gly Lys Thr Val Leu
225                 230                 235                 240

gta tct gat tca ggc atg tcc tct tct cta aca act tca aca tat tgt      768
Val Ser Asp Ser Gly Met Ser Ser Ser Leu Thr Thr Ser Thr Tyr Cys
                245                 250                 255

aaa tcc cca att cag cca tta cca cgg aaa ctc tca tca tcc aag aca      816
Lys Ser Pro Ile Gln Pro Leu Pro Arg Lys Leu Ser Ser Ser Lys Thr
            260                 265                 270

cta ccc ata ata aga aac tca caa gaa gaa ctc ttg agc tgc tgg ata      864
Leu Pro Ile Ile Arg Asn Ser Gln Glu Glu Leu Leu Ser Cys Trp Ile
        275                 280                 285

caa gtc cct ctt aag caa gaa gat gtg gaa aat aga tgt ttg gat tca      912
Gln Val Pro Leu Lys Gln Glu Asp Val Glu Asn Arg Cys Leu Asp Ser
    290                 295                 300

gga aag gct gtc caa aac gaa gga tca tcg act gga tca aac act ggt      960
Gly Lys Ala Val Gln Asn Glu Gly Ser Ser Thr Gly Ser Asn Thr Gly
305                 310                 315                 320

tcg gtg gat gat acg gga cac acg gaa aag acc aca gaa ccc gaa aca     1008
Ser Val Asp Asp Thr Gly His Thr Glu Lys Thr Thr Glu Pro Glu Thr
                325                 330                 335

atg cta tgt caa tgg gag ttt aaa cca agt gag agg tct gca ttt tct     1056
Met Leu Cys Gln Trp Glu Phe Lys Pro Ser Glu Arg Ser Ala Phe Ser
            340                 345                 350

gag ctc aga aga aca aac tcc gag tca aat tca aga gga ttt ggt cca     1104
Glu Leu Arg Arg Thr Asn Ser Glu Ser Asn Ser Arg Gly Phe Gly Pro
        355                 360                 365

tac aag aag aga aag atg gta aca gaa gaa gaa gag cat gag att cat     1152
Tyr Lys Lys Arg Lys Met Val Thr Glu Glu Glu Glu His Glu Ile His
    370                 375                 380

ctc cac tta taa                                                   1164
Leu His Leu
385
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Met Ala Ser Ser Pro Leu Thr Ala Asn Val Gln Gly Thr Asn Ala Ser
1 5 10 15

Leu Arg Asn Arg Asp Glu Glu Thr Ala Asp Lys Gln Ile Gln Phe Asn
20 25 30

Asp Gln Ser Phe Gly Gly Asn Asp Tyr Ala Pro Lys Val Arg Lys Pro
35 40 45

Tyr Thr Ile Thr Lys Glu Arg Glu Arg Trp Thr Asp Glu Glu His Lys
50 55 60

Lys Phe Val Glu Ala Leu Lys Leu Tyr Gly Arg Ala Trp Arg Arg Ile
65 70 75 80

Glu Glu His Val Gly Ser Lys Thr Ala Val Gln Ile Arg Ser His Ala
85 90 95

Gln Lys Phe Phe Ser Lys Val Ala Arg Glu Ala Thr Gly Gly Asp Gly
100 105 110

Ser Ser Val Glu Pro Ile Val Ile Pro Pro Pro Arg Pro Lys Arg Lys
115 120 125

Pro Ala His Pro Tyr Pro Arg Lys Phe Gly Asn Glu Ala Asp Gln Thr
130 135 140

Ser Arg Ser Val Ser Pro Ser Glu Arg Asp Thr Gln Ser Pro Thr Ser
145 150 155 160

Val Leu Ser Thr Val Gly Ser Glu Ala Leu Cys Ser Leu Asp Ser Ser
165 170 175

Ser Pro Asn Arg Ser Leu Ser Pro Val Ser Ser Ala Ser Pro Pro Ala
180 185 190

Ala Leu Thr Thr Thr Ala Asn Ala Pro Glu Glu Leu Glu Thr Leu Lys
195 200 205

Leu Glu Leu Phe Pro Ser Glu Arg Leu Leu Asn Arg Glu Ser Ser Ile

210 215 220

Lys Glu Pro Thr Lys Gln Ser Leu Lys Leu Phe Gly Lys Thr Val Leu
225 230 235 240

Val Ser Asp Ser Gly Met Ser Ser Ser Leu Thr Thr Ser Thr Tyr Cys
245 250 255

Lys Ser Pro Ile Gln Pro Leu Pro Arg Lys Leu Ser Ser Ser Lys Thr
260 265 270

Leu Pro Ile Ile Arg Asn Ser Gln Glu Glu Leu Leu Ser Cys Trp Ile
275 280 285

Gln Val Pro Leu Lys Gln Glu Asp Val Glu Asn Arg Cys Leu Asp Ser
290 295 300

Gly Lys Ala Val Gln Asn Glu Gly Ser Ser Thr Gly Ser Asn Thr Gly
305 310 315 320

Ser Val Asp Asp Thr Gly His Thr Glu Lys Thr Thr Glu Pro Glu Thr
325 330 335

Met Leu Cys Gln Trp Glu Phe Lys Pro Ser Glu Arg Ser Ala Phe Ser
340 345 350

Glu Leu Arg Arg Thr Asn Ser Glu Ser Asn Ser Arg Gly Phe Gly Pro
355 360 365

Tyr Lys Lys Arg Lys Met Val Thr Glu Glu Glu Glu His Glu Ile His
370 375 380

Leu His Leu
385

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<222> (19)..(666) <223> G1636

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Met Ala Ser Ser Gln Trp Thr Arg Ser Glu Asp
1 5 10

aag atg ttt gag caa gct ttg gtt ctt ttt cct gaa gga tct cct aat 99
Lys Met Phe Glu Gln Ala Leu Val Leu Phe Pro Glu Gly Ser Pro Asn

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                15                  20                  25

cgg tgg gag aga atc gct gat cag ctt cat aaa tct gct ggt gaa gtt      147
Arg Trp Glu Arg Ile Ala Asp Gln Leu His Lys Ser Ala Gly Glu Val
        30                  35                  40

agg gag cat tac gag gtc ttg gtt cat gat gtt ttc gag att gat tct      195
Arg Glu His Tyr Glu Val Leu Val His Asp Val Phe Glu Ile Asp Ser
    45                  50                  55

ggt cga gtt gat gtc cct gat tac atg gat gac tcg gcg gct gcg gcg      243
Gly Arg Val Asp Val Pro Asp Tyr Met Asp Asp Ser Ala Ala Ala Ala
60                  65                  70                  75

gcg ggt tgg gat tcc gct ggt cag atc tct ttt ggg tct aaa cat ggc      291
Ala Gly Trp Asp Ser Ala Gly Gln Ile Ser Phe Gly Ser Lys His Gly
                80                  85                  90

gag agt gaa cgc aaa aga gga act cct tgg aca gag aac gaa cac aaa      339
Glu Ser Glu Arg Lys Arg Gly Thr Pro Trp Thr Glu Asn Glu His Lys
            95                  100                 105

ttg ttt ctg atc gga tta aag aga tat ggt aag gga gat tgg agg agt      387
Leu Phe Leu Ile Gly Leu Lys Arg Tyr Gly Lys Gly Asp Trp Arg Ser
        110                 115                 120

atc tcg aga aac gtt gtg gtg acg agg aca ccg acg caa gtc gcg agt      435
Ile Ser Arg Asn Val Val Val Thr Arg Thr Pro Thr Gln Val Ala Ser
    125                 130                 135

cac gct cag aag tat ttt ctg aga cag aac tcg gtg aag aag gag agg      483
His Ala Gln Lys Tyr Phe Leu Arg Gln Asn Ser Val Lys Lys Glu Arg
140                 145                 150                 155

aaa agg tcg agc atc cat gat ata act acg gtt gat gct act ttg gct      531
Lys Arg Ser Ser Ile His Asp Ile Thr Thr Val Asp Ala Thr Leu Ala
                160                 165                 170

atg cct ggg tct aac atg gac tgg act ggc caa cac ggg agt cct gtt      579
Met Pro Gly Ser Asn Met Asp Trp Thr Gly Gln His Gly Ser Pro Val
            175                 180                 185

cag gcg ccg cag cag caa cag att atg tct gag ttc ggt cag caa ttg      627
Gln Ala Pro Gln Gln Gln Gln Ile Met Ser Glu Phe Gly Gln Gln Leu
        190                 195                 200

aat cct ggt cat ttc gag gat ttt ggg ttt cgg atg tga tg               668
Asn Pro Gly His Phe Glu Asp Phe Gly Phe Arg Met
    205                 210                 215
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<210> 250 <211> 215 <212> PRT <213> Arabidopsis thaliana <400> 250

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Met Ala Ser Ser Gln Trp Thr Arg Ser Glu Asp Lys Met Phe Glu Gln
1               5                   10                  15
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Ala Leu Val Leu Phe Pro Glu Gly Ser Pro Asn Arg Trp Glu Arg Ile
20 25 30

Ala Asp Gln Leu His Lys Ser Ala Gly Glu Val Arg Glu His Tyr Glu
35 40 45

Val Leu Val His Asp Val Phe Glu Ile Asp Ser Gly Arg Val Asp Val
50 55 60

Pro Asp Tyr Met Asp Asp Ser Ala Ala Ala Ala Ala Gly Trp Asp Ser
65 70 75 80

Ala Gly Gln Ile Ser Phe Gly Ser Lys His Gly Glu Ser Glu Arg Lys
85 90 95

Arg Gly Thr Pro Trp Thr Glu Asn Glu His Lys Leu Phe Leu Ile Gly
100 105 110

Leu Lys Arg Tyr Gly Lys Gly Asp Trp Arg Ser Ile Ser Arg Asn Val
115 120 125

Val Val Thr Arg Thr Pro Thr Gln Val Ala Ser His Ala Gln Lys Tyr
130 135 140

Phe Leu Arg Gln Asn Ser Val Lys Lys Glu Arg Lys Arg Ser Ser Ile
145 150 155 160

His Asp Ile Thr Thr Val Asp Ala Thr Leu Ala Met Pro Gly Ser Asn
165 170 175

Met Asp Trp Thr Gly Gln His Gly Ser Pro Val Gln Ala Pro Gln Gln
180 185 190

Gln Gln Ile Met Ser Glu Phe Gly Gln Gln Leu Asn Pro Gly His Phe
195 200 205

Glu Asp Phe Gly Phe Arg Met
210 215

<210> 251 <211> 1300 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (168)..(1196) <223> G1640

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agctgctcta gcttatctgg taccgtcgac ctctcactca agggtccaaa agtgttttct     120

ctttttcagt ttctctttct ctttttgaca gaagagaccg agaagca atg gga agg       176
                                                      Met Gly Arg
                                                      1

gct ccg tgt tgt gag aaa atc ggg ttg aag aga ggg aga tgg aca gcc       224
Ala Pro Cys Cys Glu Lys Ile Gly Leu Lys Arg Gly Arg Trp Thr Ala
    5                   10                  15

gag gaa gat gag atc ctc acc aag tat att cag acc aat ggt gaa ggt       272
Glu Glu Asp Glu Ile Leu Thr Lys Tyr Ile Gln Thr Asn Gly Glu Gly
20                  25                  30                  35

tct tgg cga tct ttg cct aag aaa gct gga ttg ttg aga tgt gga aag       320
Ser Trp Arg Ser Leu Pro Lys Lys Ala Gly Leu Leu Arg Cys Gly Lys
                40                  45                  50

agc tgt aga cta agg tgg ata aac tac tta aga aga gac tta aaa aga       368
Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Arg Asp Leu Lys Arg
            55                  60                  65

gga aat att act tcc gac gaa gaa gaa ata atc gtc aag ttg cat tcc       416
Gly Asn Ile Thr Ser Asp Glu Glu Glu Ile Ile Val Lys Leu His Ser
        70                  75                  80

ctt ctc ggc aac aga tgg tca ctt att gca aca cat cta cca gga aga       464
Leu Leu Gly Asn Arg Trp Ser Leu Ile Ala Thr His Leu Pro Gly Arg
    85                  90                  95

aca gac aac gaa att aaa aac tat tgg aac tca cat ctc agc cgc aaa       512
Thr Asp Asn Glu Ile Lys Asn Tyr Trp Asn Ser His Leu Ser Arg Lys
100                 105                 110                 115

atc tat gcc ttc act gcc gtt tcc gga gat gga cac aat cta ctc gtc       560
Ile Tyr Ala Phe Thr Ala Val Ser Gly Asp Gly His Asn Leu Leu Val
                120                 125                 130

aac gat gta gtc ttg aag aaa tct tgt tca tcg tct tct gga gcc aag       608
Asn Asp Val Val Leu Lys Lys Ser Cys Ser Ser Ser Ser Gly Ala Lys
            135                 140                 145

aac aat aac aag acc aag aag aag aag aag gga agg act agt agg tca       656
Asn Asn Asn Lys Thr Lys Lys Lys Lys Lys Gly Arg Thr Ser Arg Ser
        150                 155                 160

tcc atg aag aaa cac aag caa atg gtg acg gcc tca caa tgt ttc tca       704
Ser Met Lys Lys His Lys Gln Met Val Thr Ala Ser Gln Cys Phe Ser
    165                 170                 175

caa cct aag gag cta gag agt gat ttc agt gag gga ggg caa aat ggt       752
Gln Pro Lys Glu Leu Glu Ser Asp Phe Ser Glu Gly Gly Gln Asn Gly
180                 185                 190                 195

aat ttt gaa gga gag tct ttg ggg cct tat gag tgg ttg gat ggt gag       800
Asn Phe Glu Gly Glu Ser Leu Gly Pro Tyr Glu Trp Leu Asp Gly Glu
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                200                 205                 210

tta gaa cgg ctc ttg agt agt tgt gtc tgg gaa tgc act agt gaa gag      848
Leu Glu Arg Leu Leu Ser Ser Cys Val Trp Glu Cys Thr Ser Glu Glu
            215                 220                 225

gct gtg att gga gta aat gat gaa aag gtg tgt gag agt ggg gac aat      896
Ala Val Ile Gly Val Asn Asp Glu Lys Val Cys Glu Ser Gly Asp Asn
        230                 235                 240

agt agt tgt tgt gtt aat ttg ttt gaa gaa gaa caa gga agc gag aca      944
Ser Ser Cys Cys Val Asn Leu Phe Glu Glu Glu Gln Gly Ser Glu Thr
    245                 250                 255

aag att ggt cac gta gga atc aca gag gtt gat cat gat atg acg gtg      992
Lys Ile Gly His Val Gly Ile Thr Glu Val Asp His Asp Met Thr Val
260                 265                 270                 275

gaa aga gaa aga gag gga agt ttt tta agt tcg aat tca aat gaa aat     1040
Glu Arg Glu Arg Glu Gly Ser Phe Leu Ser Ser Asn Ser Asn Glu Asn
                280                 285                 290

aat gat aaa gat tgg tgg gtt ggt cta tgt aat tct tca gaa gtt ggg     1088
Asn Asp Lys Asp Trp Trp Val Gly Leu Cys Asn Ser Ser Glu Val Gly
            295                 300                 305

ttt ggg gtt gat gag gag ttg ctt gat tgg gag ttt caa ggt aat gtc     1136
Phe Gly Val Asp Glu Glu Leu Leu Asp Trp Glu Phe Gln Gly Asn Val
        310                 315                 320

act tgt caa agt gat gat cta tgg gat ctc tca gat att gga gag ata     1184
Thr Cys Gln Ser Asp Asp Leu Trp Asp Leu Ser Asp Ile Gly Glu Ile
    325                 330                 335

aca ttg gag tga ttgtaccgag caagtggatt ggcggccgct ctagacaggc         1236
Thr Leu Glu
340

ctcgtaccgg atctctagct agagctttcg ttcgtatcat cggtttcgac aacgttcgtc   1296

aagt                                                                1300


<210>  252 <211>  342 <212>  PRT <213>  Arabidopsis thaliana  <400>  252

Met Gly Arg Ala Pro Cys Cys Glu Lys Ile Gly Leu Lys Arg Gly Arg
1               5                   10                  15


Trp Thr Ala Glu Glu Asp Glu Ile Leu Thr Lys Tyr Ile Gln Thr Asn
            20                  25                  30


Gly Glu Gly Ser Trp Arg Ser Leu Pro Lys Lys Ala Gly Leu Leu Arg
        35                  40                  45
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Cys Gly Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Arg Asp
50 55 60

Leu Lys Arg Gly Asn Ile Thr Ser Asp Glu Glu Glu Ile Ile Val Lys
65 70 75 80

Leu His Ser Leu Leu Gly Asn Arg Trp Ser Leu Ile Ala Thr His Leu
85 90 95

Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp Asn Ser His Leu
100 105 110

Ser Arg Lys Ile Tyr Ala Phe Thr Ala Val Ser Gly Asp Gly His Asn
115 120 125

Leu Leu Val Asn Asp Val Val Leu Lys Lys Ser Cys Ser Ser Ser Ser
130 135 140

Gly Ala Lys Asn Asn Asn Lys Thr Lys Lys Lys Lys Lys Gly Arg Thr
145 150 155 160

Ser Arg Ser Ser Met Lys Lys His Lys Gln Met Val Thr Ala Ser Gln
165 170 175

Cys Phe Ser Gln Pro Lys Glu Leu Glu Ser Asp Phe Ser Glu Gly Gly
180 185 190

Gln Asn Gly Asn Phe Glu Gly Glu Ser Leu Gly Pro Tyr Glu Trp Leu
195 200 205

Asp Gly Glu Leu Glu Arg Leu Leu Ser Ser Cys Val Trp Glu Cys Thr
210 215 220

Ser Glu Glu Ala Val Ile Gly Val Asn Asp Glu Lys Val Cys Glu Ser
225 230 235 240

Gly Asp Asn Ser Ser Cys Cys Val Asn Leu Phe Glu Glu Glu Gln Gly
245 250 255

Ser Glu Thr Lys Ile Gly His Val Gly Ile Thr Glu Val Asp His Asp
260 265 270

Met Thr Val Glu Arg Glu Arg Glu Gly Ser Phe Leu Ser Ser Asn Ser

275 280 285

Asn Glu Asn Asn Asp Lys Asp Trp Trp Val Gly Leu Cys Asn Ser Ser
290 295 300

Glu Val Gly Phe Gly Val Asp Glu Glu Leu Leu Asp Trp Glu Phe Gln
305 310 315 320

Gly Asn Val Thr Cys Gln Ser Asp Asp Leu Trp Asp Leu Ser Asp Ile
325 330 335

Gly Glu Ile Thr Leu Glu
340

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<222> (1)..(867) <223> G1641

<400> 253

atg gag gtt atg aga ccg tcg acg tca cac gtg tca ggt ggg aac tgg 48
Met Glu Val Met Arg Pro Ser Thr Ser His Val Ser Gly Gly Asn Trp
1 5 10 15

ctc atg gag gaa act aag agc ggc gtc gca gct tct ggt gaa ggt gcc 96
Leu Met Glu Glu Thr Lys Ser Gly Val Ala Ala Ser Gly Glu Gly Ala
20 25 30

acg tgg acg gcg gca gag aac aag gca ttc gag aat gct ttg gcg gtt 144
Thr Trp Thr Ala Ala Glu Asn Lys Ala Phe Glu Asn Ala Leu Ala Val
35 40 45

tac gac gac aac act cct gat cgg tgg cag aag gtg gct gcg gtg att 192
Tyr Asp Asp Asn Thr Pro Asp Arg Trp Gln Lys Val Ala Ala Val Ile
50 55 60

ccg ggg aag aca gtg agt gac gta att aga cag tat aac gat ttg gaa 240
Pro Gly Lys Thr Val Ser Asp Val Ile Arg Gln Tyr Asn Asp Leu Glu
65 70 75 80

gct gat gtc agc agc atc gag gcc ggt tta atc ccg gtc ccc ggt tac 288
Ala Asp Val Ser Ser Ile Glu Ala Gly Leu Ile Pro Val Pro Gly Tyr
85 90 95

atc acc tcg ccg cct ttc act cta gat tgg gcc ggc ggc ggt ggc gga 336
Ile Thr Ser Pro Pro Phe Thr Leu Asp Trp Ala Gly Gly Gly Gly Gly
100 105 110

tgt aac ggg ttt aaa ccg ggt cat cag gtt tgt aat aaa cgg tcg cag 384
Cys Asn Gly Phe Lys Pro Gly His Gln Val Cys Asn Lys Arg Ser Gln
115 120 125

gcc ggt aga tcg ccg gag ctg gag cgg aag aaa ggc gtt cct tgg acg 432
Ala Gly Arg Ser Pro Glu Leu Glu Arg Lys Lys Gly Val Pro Trp Thr

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    130                 135                 140

gag gaa gaa cac aag cta ttt cta atg ggt ttg aag aaa tat ggg aaa      480
Glu Glu Glu His Lys Leu Phe Leu Met Gly Leu Lys Lys Tyr Gly Lys
145                 150                 155                 160

gga gat tgg aga aac ata tct cgg aac ttt gtg ata acg cga acg cca      528
Gly Asp Trp Arg Asn Ile Ser Arg Asn Phe Val Ile Thr Arg Thr Pro
                165                 170                 175

aca caa gta gct agc cac gcc caa aag tac ttc atc cgg caa ctt tcc      576
Thr Gln Val Ala Ser His Ala Gln Lys Tyr Phe Ile Arg Gln Leu Ser
            180                 185                 190

ggc ggc aag gac aag aga cga gca agc att cac gac ata acc acc gta      624
Gly Gly Lys Asp Lys Arg Arg Ala Ser Ile His Asp Ile Thr Thr Val
        195                 200                 205

aat ctc gaa gag gag gct tct ttg gag acc aat aag agc tcc att gtt      672
Asn Leu Glu Glu Glu Ala Ser Leu Glu Thr Asn Lys Ser Ser Ile Val
    210                 215                 220

gtt gga gat cag cgt tca agg cta acc gcg ttt cct tgg aac caa acg      720
Val Gly Asp Gln Arg Ser Arg Leu Thr Ala Phe Pro Trp Asn Gln Thr
225                 230                 235                 240

gac aac aat gga aca cag gca gac gct ttc aat ata acg att gga aac      768
Asp Asn Asn Gly Thr Gln Ala Asp Ala Phe Asn Ile Thr Ile Gly Asn
                245                 250                 255

gct att agt ggc gtt cat tca tac ggc cag gtt atg att gga ggg tat      816
Ala Ile Ser Gly Val His Ser Tyr Gly Gln Val Met Ile Gly Gly Tyr
            260                 265                 270

aac aat gca gat tct tgc tat gac gcc caa aac aca atg ttt caa cta      864
Asn Asn Ala Asp Ser Cys Tyr Asp Ala Gln Asn Thr Met Phe Gln Leu
        275                 280                 285

tag                                                                  867

<210>  254 <211>  288 <212>  PRT <213>  Arabidopsis thaliana  <400>  254

Met Glu Val Met Arg Pro Ser Thr Ser His Val Ser Gly Gly Asn Trp
1               5                   10                  15

Leu Met Glu Glu Thr Lys Ser Gly Val Ala Ala Ser Gly Glu Gly Ala
            20                  25                  30

Thr Trp Thr Ala Ala Glu Asn Lys Ala Phe Glu Asn Ala Leu Ala Val
        35                  40                  45

Tyr Asp Asp Asn Thr Pro Asp Arg Trp Gln Lys Val Ala Ala Val Ile
    50                  55                  60
```

Pro Gly Lys Thr Val Ser Asp Val Ile Arg Gln Tyr Asn Asp Leu Glu
65 70 75 80

Ala Asp Val Ser Ser Ile Glu Ala Gly Leu Ile Pro Val Pro Gly Tyr
85 90 95

Ile Thr Ser Pro Pro Phe Thr Leu Asp Trp Ala Gly Gly Gly Gly Gly
100 105 110

Cys Asn Gly Phe Lys Pro Gly His Gln Val Cys Asn Lys Arg Ser Gln
115 120 125

Ala Gly Arg Ser Pro Glu Leu Glu Arg Lys Lys Gly Val Pro Trp Thr
130 135 140

Glu Glu Glu His Lys Leu Phe Leu Met Gly Leu Lys Lys Tyr Gly Lys
145 150 155 160

Gly Asp Trp Arg Asn Ile Ser Arg Asn Phe Val Ile Thr Arg Thr Pro
165 170 175

Thr Gln Val Ala Ser His Ala Gln Lys Tyr Phe Ile Arg Gln Leu Ser
180 185 190

Gly Gly Lys Asp Lys Arg Arg Ala Ser Ile His Asp Ile Thr Thr Val
195 200 205

Asn Leu Glu Glu Glu Ala Ser Leu Glu Thr Asn Lys Ser Ser Ile Val
210 215 220

Val Gly Asp Gln Arg Ser Arg Leu Thr Ala Phe Pro Trp Asn Gln Thr
225 230 235 240

Asp Asn Asn Gly Thr Gln Ala Asp Ala Phe Asn Ile Thr Ile Gly Asn
245 250 255

Ala Ile Ser Gly Val His Ser Tyr Gly Gln Val Met Ile Gly Gly Tyr
260 265 270

Asn Asn Ala Asp Ser Cys Tyr Asp Ala Gln Asn Thr Met Phe Gln Leu
275 280 285

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<222> (34)..(786) <223> G1646

<400> 255

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gatcttttga tccaatcaca aggcaaagat cca atg gac aat aac aac aac aac      54
                                    Met Asp Asn Asn Asn Asn Asn
                                    1               5

aac aac cag caa cca cca cca acc tcc gtc tat cca cct ggc tcc gcc      102
Asn Asn Gln Gln Pro Pro Pro Thr Ser Val Tyr Pro Pro Gly Ser Ala
        10                  15                  20

gtc aca acc gta atc cct cct cca cca tct gga tct gca tca ata gtc      150
Val Thr Thr Val Ile Pro Pro Pro Pro Ser Gly Ser Ala Ser Ile Val
    25                  30                  35

acc gga gga gga gcg aca tac cac cac ctc ctc cag caa caa cag caa      198
Thr Gly Gly Gly Ala Thr Tyr His His Leu Leu Gln Gln Gln Gln Gln
40                  45                  50                  55

cag ctt caa atg ttc tgg aca tac cag aga caa gag atc gaa cag gta      246
Gln Leu Gln Met Phe Trp Thr Tyr Gln Arg Gln Glu Ile Glu Gln Val
                60                  65                  70

aac gat ttc aaa aac cat cag ctc cct cta gct cgt atc aaa aaa atc      294
Asn Asp Phe Lys Asn His Gln Leu Pro Leu Ala Arg Ile Lys Lys Ile
            75                  80                  85

atg aaa gct gat gaa gat gtg cgt atg atc tcc gcc gaa gca ccg att      342
Met Lys Ala Asp Glu Asp Val Arg Met Ile Ser Ala Glu Ala Pro Ile
        90                  95                  100

ctc ttc gcg aaa gct tgt gag ctt ttc att ctc gaa ctt acg att aga      390
Leu Phe Ala Lys Ala Cys Glu Leu Phe Ile Leu Glu Leu Thr Ile Arg
    105                 110                 115

tct tgg ctt cac gct gaa gag aac aaa cgt cgt acg ctt cag aaa aac      438
Ser Trp Leu His Ala Glu Glu Asn Lys Arg Arg Thr Leu Gln Lys Asn
120                 125                 130                 135

gat atc gct gct gcg att act aga acc gat atc ttc gat ttc ctt gtt      486
Asp Ile Ala Ala Ala Ile Thr Arg Thr Asp Ile Phe Asp Phe Leu Val
                140                 145                 150

gat att gtt cct agg gaa gag atc aag gaa gag gaa gat gca gca tcg      534
Asp Ile Val Pro Arg Glu Glu Ile Lys Glu Glu Glu Asp Ala Ala Ser
            155                 160                 165

gct ctt ggt gga gga ggt atg gtt gct ccc gcc gcg agc ggt gtt cct      582
Ala Leu Gly Gly Gly Gly Met Val Ala Pro Ala Ala Ser Gly Val Pro
        170                 175                 180

tat tat tat cca ccg atg gga caa ccg gcg gtt cct gga ggg atg atg      630
Tyr Tyr Tyr Pro Pro Met Gly Gln Pro Ala Val Pro Gly Gly Met Met
    185                 190                 195
```

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att gga aga ccg gcg atg gat cct agc ggt gtt tat gct cag cct cct      678
Ile Gly Arg Pro Ala Met Asp Pro Ser Gly Val Tyr Ala Gln Pro Pro
200                 205                 210                 215

tct cag gca tgg caa agc gtt tgg cag aat tca gct ggt ggt ggt gat      726
Ser Gln Ala Trp Gln Ser Val Trp Gln Asn Ser Ala Gly Gly Gly Asp
                220                 225                 230

gat gtg tct tat gga agt gga gga agt agc ggc cat ggt aat ctc gat      774
Asp Val Ser Tyr Gly Ser Gly Gly Ser Ser Gly His Gly Asn Leu Asp
            235                 240                 245

agc caa ggg taa gtgaattcta gtag                                     800
Ser Gln Gly
        250
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<210> 256 <211> 250 <212> PRT <213> Arabidopsis thaliana <400> 256

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Met Asp Asn Asn Asn Asn Asn Asn Asn Gln Gln Pro Pro Pro Thr Ser
1               5                   10                  15

Val Tyr Pro Pro Gly Ser Ala Val Thr Thr Val Ile Pro Pro Pro Pro
            20                  25                  30

Ser Gly Ser Ala Ser Ile Val Thr Gly Gly Gly Ala Thr Tyr His His
        35                  40                  45

Leu Leu Gln Gln Gln Gln Gln Gln Leu Gln Met Phe Trp Thr Tyr Gln
    50                  55                  60

Arg Gln Glu Ile Glu Gln Val Asn Asp Phe Lys Asn His Gln Leu Pro
65                  70                  75                  80

Leu Ala Arg Ile Lys Lys Ile Met Lys Ala Asp Glu Asp Val Arg Met
                85                  90                  95

Ile Ser Ala Glu Ala Pro Ile Leu Phe Ala Lys Ala Cys Glu Leu Phe
            100                 105                 110

Ile Leu Glu Leu Thr Ile Arg Ser Trp Leu His Ala Glu Glu Asn Lys
        115                 120                 125

Arg Arg Thr Leu Gln Lys Asn Asp Ile Ala Ala Ala Ile Thr Arg Thr
    130                 135                 140

Asp Ile Phe Asp Phe Leu Val Asp Ile Val Pro Arg Glu Glu Ile Lys
145                 150                 155                 160
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Glu Glu Glu Asp Ala Ala Ser Ala Leu Gly Gly Gly Gly Met Val Ala
165 170 175

Pro Ala Ala Ser Gly Val Pro Tyr Tyr Tyr Pro Pro Met Gly Gln Pro
180 185 190

Ala Val Pro Gly Gly Met Met Ile Gly Arg Pro Ala Met Asp Pro Ser
195 200 205

Gly Val Tyr Ala Gln Pro Pro Ser Gln Ala Trp Gln Ser Val Trp Gln
210 215 220

Asn Ser Ala Gly Gly Gly Asp Asp Val Ser Tyr Gly Ser Gly Gly Ser
225 230 235 240

Ser Gly His Gly Asn Leu Asp Ser Gln Gly
245 250

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<222> (142)..(903) <223> G1667

<400> 257
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caaaatctcc ttacttaaac tcacaaactc ctcacaaatt ttctgaatct ttcagttgaa 120

catataacaa cattcataac a atg gct gga ggt aca gct cta act cca acc 171
Met Ala Gly Gly Thr Ala Leu Thr Pro Thr
1 5 10

tct gta gga tcc aag tct gtt cca atg agg aac cat gaa gca aca gag 219
Ser Val Gly Ser Lys Ser Val Pro Met Arg Asn His Glu Ala Thr Glu
15 20 25

aga ggc aac acc aac aac aac ctg aga gca tta ccc aaa gcc gtc caa 267
Arg Gly Asn Thr Asn Asn Asn Leu Arg Ala Leu Pro Lys Ala Val Gln
30 35 40

ccg gtt tca tca atc gaa gga gag atg gct aag agg cca cgt ggc aga 315
Pro Val Ser Ser Ile Glu Gly Glu Met Ala Lys Arg Pro Arg Gly Arg
45 50 55

ccc gct ggc tcc aag aac aaa ccc aaa cca cca atc att gtg act cac 363
Pro Ala Gly Ser Lys Asn Lys Pro Lys Pro Pro Ile Ile Val Thr His
60 65 70

gac agt cca aat tcc ctc aga gct aac gcc gtt gag atc agc tca ggt 411
Asp Ser Pro Asn Ser Leu Arg Ala Asn Ala Val Glu Ile Ser Ser Gly
75 80 85 90

```
tgt gac atc tgt gag act tta tcg gat ttt gca aga agg aaa cag aga      459
Cys Asp Ile Cys Glu Thr Leu Ser Asp Phe Ala Arg Arg Lys Gln Arg
                95                  100                 105

ggt ctc tgc att ctc agt gcc aat ggt tgt gtc acc aat gtg aca tta      507
Gly Leu Cys Ile Leu Ser Ala Asn Gly Cys Val Thr Asn Val Thr Leu
            110                 115                 120

agg caa cca gct tca tca gga gca att gtc aca tta cac gga cgt tac      555
Arg Gln Pro Ala Ser Ser Gly Ala Ile Val Thr Leu His Gly Arg Tyr
        125                 130                 135

gag atc ctc tca ttg ctt gga tca atc ttg cct cca cca gca cca ctt      603
Glu Ile Leu Ser Leu Leu Gly Ser Ile Leu Pro Pro Pro Ala Pro Leu
    140                 145                 150

gga ata act ggt ctg acc att tac tta gcc gga cct caa gga cag gtt      651
Gly Ile Thr Gly Leu Thr Ile Tyr Leu Ala Gly Pro Gln Gly Gln Val
155                 160                 165                 170

gtt ggt gga gga gtg gtt ggt ggg cta atc gca tct ggt cct gtt gtt      699
Val Gly Gly Gly Val Val Gly Gly Leu Ile Ala Ser Gly Pro Val Val
                175                 180                 185

ctc atg gct gca tct ttc atg aat gct gtt ttt gat cgt ctt cct atg      747
Leu Met Ala Ala Ser Phe Met Asn Ala Val Phe Asp Arg Leu Pro Met
            190                 195                 200

gat gat gat gaa gct gcc tct atg cag aac cag cag tac tac cag aat      795
Asp Asp Asp Glu Ala Ala Ser Met Gln Asn Gln Gln Tyr Tyr Gln Asn
        205                 210                 215

gga aga tcc cgt cct tta gat gac att cat gga ctg cct caa aat ctg      843
Gly Arg Ser Arg Pro Leu Asp Asp Ile His Gly Leu Pro Gln Asn Leu
    220                 225                 230

ctc act aat gga aac tcg gct tct gat atc tac tct tgg ggg cct tgg      891
Leu Thr Asn Gly Asn Ser Ala Ser Asp Ile Tyr Ser Trp Gly Pro Trp
235                 240                 245                 250

aat caa aga taa atgtgtctgt aggttgagag agaaccgtaa gtctg               938
Asn Gln Arg
```

<210> 258 <211> 253 <212> PRT <213> Arabidopsis thaliana <400> 258

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Met Ala Gly Gly Thr Ala Leu Thr Pro Thr Ser Val Gly Ser Lys Ser
1               5                   10                  15

Val Pro Met Arg Asn His Glu Ala Thr Glu Arg Gly Asn Thr Asn Asn
            20                  25                  30

Asn Leu Arg Ala Leu Pro Lys Ala Val Gln Pro Val Ser Ser Ile Glu
```

```
        35                  40                  45

Gly Glu Met Ala Lys Arg Pro Arg Gly Arg Pro Ala Gly Ser Lys Asn
    50                  55                  60

Lys Pro Lys Pro Pro Ile Ile Val Thr His Asp Ser Pro Asn Ser Leu
65                  70                  75                  80

Arg Ala Asn Ala Val Glu Ile Ser Ser Gly Cys Asp Ile Cys Glu Thr
                85                  90                  95

Leu Ser Asp Phe Ala Arg Arg Lys Gln Arg Gly Leu Cys Ile Leu Ser
            100                 105                 110

Ala Asn Gly Cys Val Thr Asn Val Thr Leu Arg Gln Pro Ala Ser Ser
        115                 120                 125

Gly Ala Ile Val Thr Leu His Gly Arg Tyr Glu Ile Leu Ser Leu Leu
    130                 135                 140

Gly Ser Ile Leu Pro Pro Pro Ala Pro Leu Gly Ile Thr Gly Leu Thr
145                 150                 155                 160

Ile Tyr Leu Ala Gly Pro Gln Gly Gln Val Val Gly Gly Gly Val Val
                165                 170                 175

Gly Gly Leu Ile Ala Ser Gly Pro Val Val Leu Met Ala Ala Ser Phe
            180                 185                 190

Met Asn Ala Val Phe Asp Arg Leu Pro Met Asp Asp Asp Glu Ala Ala
        195                 200                 205

Ser Met Gln Asn Gln Gln Tyr Tyr Gln Asn Gly Arg Ser Arg Pro Leu
    210                 215                 220

Asp Asp Ile His Gly Leu Pro Gln Asn Leu Leu Thr Asn Gly Asn Ser
225                 230                 235                 240

Ala Ser Asp Ile Tyr Ser Trp Gly Pro Trp Asn Gln Arg
                245                 250
```

<210> 259 <211> 1221 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (1)..(1221) <223> G1706

<400> 259

```
atg aaa aat aaa acc caa aaa tat ata gat aag aag acg tgg aac tat        48
Met Lys Asn Lys Thr Gln Lys Tyr Ile Asp Lys Lys Thr Trp Asn Tyr
1               5                   10                  15

ata aat atg gac cac cat cac gcc ttt gca tca cat tca tac aac tca        96
Ile Asn Met Asp His His His Ala Phe Ala Ser His Ser Tyr Asn Ser
            20                  25                  30

gtt ttc ata agc aaa aag gca atg gaa gag tca cga tcc tac aga aag       144
Val Phe Ile Ser Lys Lys Ala Met Glu Glu Ser Arg Ser Tyr Arg Lys
        35                  40                  45

gag agg aag cag aca aag aag aaa acg ggt cgt ggg tca gga tcc agg       192
Glu Arg Lys Gln Thr Lys Lys Lys Thr Gly Arg Gly Ser Gly Ser Arg
    50                  55                  60

tcg atc cat ata aag atg agg aag ctt cga gtg ctt ata ccg ggt gga       240
Ser Ile His Ile Lys Met Arg Lys Leu Arg Val Leu Ile Pro Gly Gly
65                  70                  75                  80

cga aga ttg aac caa ccg gat ctg ctt cta tca aag act gct gat tat       288
Arg Arg Leu Asn Gln Pro Asp Leu Leu Leu Ser Lys Thr Ala Asp Tyr
                85                  90                  95

att atg cat ttg gag ttg agg att agc att cta cat ttg ttg gtc aga       336
Ile Met His Leu Glu Leu Arg Ile Ser Ile Leu His Leu Leu Val Arg
            100                 105                 110

tat tac tta aag aag aaa aga tca aac ctt tcg tca tca cca aac gaa       384
Tyr Tyr Leu Lys Lys Lys Arg Ser Asn Leu Ser Ser Ser Pro Asn Glu
        115                 120                 125

tct aat caa aac cca gaa ttt tcc gac tcc gat act tac caa aga cag       432
Ser Asn Gln Asn Pro Glu Phe Ser Asp Ser Asp Thr Tyr Gln Arg Gln
    130                 135                 140

ctt caa cag ctc ttt cat ctc cat gat tca ggt cta gat caa gct tta       480
Leu Gln Gln Leu Phe His Leu His Asp Ser Gly Leu Asp Gln Ala Leu
145                 150                 155                 160

atc gat gct ctt cct gtg ttt ctt tac aaa gag atc aaa ggt acg aaa       528
Ile Asp Ala Leu Pro Val Phe Leu Tyr Lys Glu Ile Lys Gly Thr Lys
                165                 170                 175

gag cct ttt gat tgt gca gtg tgt ctc tgt gaa ttc tcg gaa gat gat       576
Glu Pro Phe Asp Cys Ala Val Cys Leu Cys Glu Phe Ser Glu Asp Asp
            180                 185                 190

aag ctt aga ttg ctt ccg aat tgt agt cac gct ttt cac ata gat tgt       624
Lys Leu Arg Leu Leu Pro Asn Cys Ser His Ala Phe His Ile Asp Cys
        195                 200                 205

atc gat act tgg ctt ctc tcg aat tcg act tgt cca ctt tgt aga gga       672
Ile Asp Thr Trp Leu Leu Ser Asn Ser Thr Cys Pro Leu Cys Arg Gly
    210                 215                 220
```

```
acc ctt ttc tct tta ggt cat caa ttt gaa tac cct gat ttc aat ttc      720
Thr Leu Phe Ser Leu Gly His Gln Phe Glu Tyr Pro Asp Phe Asn Phe
225                 230                 235                 240

ggg ttt ttc gcc gga gat gat gga gga gga gga gtt agg gtt tct ccg      768
Gly Phe Phe Ala Gly Asp Asp Gly Gly Gly Gly Val Arg Val Ser Pro
                245                 250                 255

gtt cag aaa cca gct gag aat gag att ggg aag aga gtg ttt tca gtg      816
Val Gln Lys Pro Ala Glu Asn Glu Ile Gly Lys Arg Val Phe Ser Val
            260                 265                 270

agg ctt ggt aag ttt agg agc agt aat att gtc aac aat ggt gaa gta      864
Arg Leu Gly Lys Phe Arg Ser Ser Asn Ile Val Asn Asn Gly Glu Val
        275                 280                 285

gta gta gga gga gga gga gag aca agt agt agt agt ctt gat aat aga      912
Val Val Gly Gly Gly Gly Glu Thr Ser Ser Ser Ser Leu Asp Asn Arg
    290                 295                 300

aga tgt ttc tca atg ggg tct tat cag tac ata gtg gct gaa tca gat      960
Arg Cys Phe Ser Met Gly Ser Tyr Gln Tyr Ile Val Ala Glu Ser Asp
305                 310                 315                 320

ctg gtt gtt gct ttg tgt cct aat aat gaa gga ttg aag aat aat aag     1008
Leu Val Val Ala Leu Cys Pro Asn Asn Glu Gly Leu Lys Asn Asn Lys
                325                 330                 335

gat gtt gaa ggg aag aag att aat atg aga agt aaa ggt gag agc ttt     1056
Asp Val Glu Gly Lys Lys Ile Asn Met Arg Ser Lys Gly Glu Ser Phe
            340                 345                 350

tct gtg tca aag att tgg caa tgg tct aat aag aga tca aag ttt cct     1104
Ser Val Ser Lys Ile Trp Gln Trp Ser Asn Lys Arg Ser Lys Phe Pro
        355                 360                 365

aat aat cat cca tca gag act aat ctt gtg gtt ggt ggt tct tct tct     1152
Asn Asn His Pro Ser Glu Thr Asn Leu Val Val Gly Gly Ser Ser Ser
    370                 375                 380

tct tct tct tat gtt tgt tct gga tct gat ggg tta tca ttg aat gga     1200
Ser Ser Ser Tyr Val Cys Ser Gly Ser Asp Gly Leu Ser Leu Asn Gly
385                 390                 395                 400

agg aga ttt cag ggt cca tga                                        1221
Arg Arg Phe Gln Gly Pro
                405
```

<210> 260 <211> 406 <212> PRT <213> Arabidopsis thaliana <400> 260

```
Met Lys Asn Lys Thr Gln Lys Tyr Ile Asp Lys Lys Thr Trp Asn Tyr
1               5                   10                  15

Ile Asn Met Asp His His His Ala Phe Ala Ser His Ser Tyr Asn Ser
```

Substitute Sheet (Rule 26)

```
            20                  25                  30

Val Phe Ile Ser Lys Lys Ala Met Glu Glu Ser Arg Ser Tyr Arg Lys
        35                  40                  45

Glu Arg Lys Gln Thr Lys Lys Lys Thr Gly Arg Gly Ser Gly Ser Arg
    50                  55                  60

Ser Ile His Ile Lys Met Arg Lys Leu Arg Val Leu Ile Pro Gly Gly
65                  70                  75                  80

Arg Arg Leu Asn Gln Pro Asp Leu Leu Leu Ser Lys Thr Ala Asp Tyr
                85                  90                  95

Ile Met His Leu Glu Leu Arg Ile Ser Ile Leu His Leu Leu Val Arg
            100                 105                 110

Tyr Tyr Leu Lys Lys Lys Arg Ser Asn Leu Ser Ser Ser Pro Asn Glu
        115                 120                 125

Ser Asn Gln Asn Pro Glu Phe Ser Asp Ser Asp Thr Tyr Gln Arg Gln
    130                 135                 140

Leu Gln Gln Leu Phe His Leu His Asp Ser Gly Leu Asp Gln Ala Leu
145                 150                 155                 160

Ile Asp Ala Leu Pro Val Phe Leu Tyr Lys Glu Ile Lys Gly Thr Lys
                165                 170                 175

Glu Pro Phe Asp Cys Ala Val Cys Leu Cys Glu Phe Ser Glu Asp Asp
            180                 185                 190

Lys Leu Arg Leu Leu Pro Asn Cys Ser His Ala Phe His Ile Asp Cys
        195                 200                 205

Ile Asp Thr Trp Leu Leu Ser Asn Ser Thr Cys Pro Leu Cys Arg Gly
    210                 215                 220

Thr Leu Phe Ser Leu Gly His Gln Phe Glu Tyr Pro Asp Phe Asn Phe
225                 230                 235                 240

Gly Phe Phe Ala Gly Asp Asp Gly Gly Gly Gly Val Arg Val Ser Pro
                245                 250                 255
```

Val Gln Lys Pro Ala Glu Asn Glu Ile Gly Lys Arg Val Phe Ser Val
260 265 270

Arg Leu Gly Lys Phe Arg Ser Ser Asn Ile Val Asn Asn Gly Glu Val
275 280 285

Val Val Gly Gly Gly Gly Glu Thr Ser Ser Ser Ser Leu Asp Asn Arg
290 295 300

Arg Cys Phe Ser Met Gly Ser Tyr Gln Tyr Ile Val Ala Glu Ser Asp
305 310 315 320

Leu Val Val Ala Leu Cys Pro Asn Asn Glu Gly Leu Lys Asn Asn Lys
325 330 335

Asp Val Glu Gly Lys Lys Ile Asn Met Arg Ser Lys Gly Glu Ser Phe
340 345 350

Ser Val Ser Lys Ile Trp Gln Trp Ser Asn Lys Arg Ser Lys Phe Pro
355 360 365

Asn Asn His Pro Ser Glu Thr Asn Leu Val Val Gly Gly Ser Ser Ser
370 375 380

Ser Ser Ser Tyr Val Cys Ser Gly Ser Asp Gly Leu Ser Leu Asn Gly
385 390 395 400

Arg Arg Phe Gln Gly Pro
405

<210> 261 <211> 1410 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (32)..(1216) <223> G1766

<400> 261
aggctattct cggaaaaaca aagaataaag a atg aat tcg ttt tca caa gta 52
Met Asn Ser Phe Ser Gln Val
1 5

cct cct ggc ttc aga ttt cat cct act gat gaa gaa ctt gta gac tac 100
Pro Pro Gly Phe Arg Phe His Pro Thr Asp Glu Glu Leu Val Asp Tyr
10 15 20

tac ttg agg aaa aaa gtt gca tca aag aga ata gaa atc gat atc atc 148
Tyr Leu Arg Lys Lys Val Ala Ser Lys Arg Ile Glu Ile Asp Ile Ile
25 30 35

```
aag gat gtt gat ctt tac aag att gag cca tgt gat ctt caa gag tta      196
Lys Asp Val Asp Leu Tyr Lys Ile Glu Pro Cys Asp Leu Gln Glu Leu
40                  45                  50                  55

tgc aag ata gga aac gaa gag cag agc gaa tgg tac ttc ttt agt cat      244
Cys Lys Ile Gly Asn Glu Glu Gln Ser Glu Trp Tyr Phe Phe Ser His
                60                  65                  70

aaa gac aag aag tat ccc acg gga act cga acc aat aga gcc acg aaa      292
Lys Asp Lys Lys Tyr Pro Thr Gly Thr Arg Thr Asn Arg Ala Thr Lys
            75                  80                  85

gca gga ttt tgg aaa gcc act gga aga gac aag gct ata tat ata aga      340
Ala Gly Phe Trp Lys Ala Thr Gly Arg Asp Lys Ala Ile Tyr Ile Arg
        90                  95                  100

cat agt ctt atc ggt atg agg aaa aca ctt gtg ttt tac aaa gga aga      388
His Ser Leu Ile Gly Met Arg Lys Thr Leu Val Phe Tyr Lys Gly Arg
    105                 110                 115

gcc cca aat ggt cag aaa tcc gat tgg atc atg cac gaa tat cgc tta      436
Ala Pro Asn Gly Gln Lys Ser Asp Trp Ile Met His Glu Tyr Arg Leu
120                 125                 130                 135

gaa aca agt gaa aat gga acc cct cag gaa gaa gga tgg gta gta tgt      484
Glu Thr Ser Glu Asn Gly Thr Pro Gln Glu Glu Gly Trp Val Val Cys
                140                 145                 150

agg gta ttc aag aag aaa ttg gca gcg aca gtg agg aaa atg gga gat      532
Arg Val Phe Lys Lys Lys Leu Ala Ala Thr Val Arg Lys Met Gly Asp
            155                 160                 165

tac cat tca tca cca tcg cag cat tgg tac gat gat cag ctc tct ttt      580
Tyr His Ser Ser Pro Ser Gln His Trp Tyr Asp Asp Gln Leu Ser Phe
        170                 175                 180

atg gcc tcc gag atc att tct agt tct cca cga cag ttt ctt ccc aat      628
Met Ala Ser Glu Ile Ile Ser Ser Ser Pro Arg Gln Phe Leu Pro Asn
    185                 190                 195

cat cat tat aac cgc cac cat cac cag cag aca ttg cct tgt ggc ctc      676
His His Tyr Asn Arg His His His Gln Gln Thr Leu Pro Cys Gly Leu
200                 205                 210                 215

aat gca ttc aac aac aac aat cct aac ttg caa tgc aag caa gag ctc      724
Asn Ala Phe Asn Asn Asn Asn Pro Asn Leu Gln Cys Lys Gln Glu Leu
                220                 225                 230

gag tta cat tac aat caa atg gta caa cat caa caa caa aac cat cat      772
Glu Leu His Tyr Asn Gln Met Val Gln His Gln Gln Gln Asn His His
            235                 240                 245

ctt cgt gaa tct atg ttt ctc cag ctt cct cag ctc gaa agc cct acc      820
Leu Arg Glu Ser Met Phe Leu Gln Leu Pro Gln Leu Glu Ser Pro Thr
        250                 255                 260
```

agt aat tgc aat tct gac aac aac aat aac aca aga aat att agt aac 868
Ser Asn Cys Asn Ser Asp Asn Asn Asn Asn Thr Arg Asn Ile Ser Asn
265 270 275

ttg cag aaa tca tca aat ata tct cat gag gaa caa ttg caa caa ggg 916
Leu Gln Lys Ser Ser Asn Ile Ser His Glu Glu Gln Leu Gln Gln Gly
280 285 290 295

aat caa agt ttc agc tct ctg tat tac gat caa gga gta gag caa atg 964
Asn Gln Ser Phe Ser Ser Leu Tyr Tyr Asp Gln Gly Val Glu Gln Met
300 305 310

act act gac tgg aga gtt ctc gat aaa ttt gtt gct tca cag ctt agc 1012
Thr Thr Asp Trp Arg Val Leu Asp Lys Phe Val Ala Ser Gln Leu Ser
315 320 325

aat gat gaa gag gct gca gcc gtg gtt tct tct tct tct cat caa aac 1060
Asn Asp Glu Glu Ala Ala Ala Val Val Ser Ser Ser Ser His Gln Asn
330 335 340

aac gtc aag att gac acg aga aac acg ggt tat cat gtg ata gat gag 1108
Asn Val Lys Ile Asp Thr Arg Asn Thr Gly Tyr His Val Ile Asp Glu
345 350 355

gga ata aat ttg ccg gag aat gat tct gaa agg gtt gtt gaa atg gga 1156
Gly Ile Asn Leu Pro Glu Asn Asp Ser Glu Arg Val Val Glu Met Gly
360 365 370 375

gaa gag tat tca aat gct cat gct gct tct act tct tca agt tgt cag 1204
Glu Glu Tyr Ser Asn Ala His Ala Ala Ser Thr Ser Ser Ser Cys Gln
380 385 390

att gat ctc tag aaatagtgat agagagatga aaaagatgca aggtgaatat 1256
Ile Asp Leu

atatgaaaat acatgcacac tagtgttatt tatacttaaa gatggaaggg gaaaaacaag 1316

gagttatttc ctggatttat ggaggttttg tacataataa aaacctacaa ccatatggta 1376

ttttcttttg aaaaaaaaaa aaaaaaaaaa aaaa 1410

<210> 262 <211> 394 <212> PRT <213> Arabidopsis thaliana <400> 262

Met Asn Ser Phe Ser Gln Val Pro Pro Gly Phe Arg Phe His Pro Thr
1 5 10 15

Asp Glu Glu Leu Val Asp Tyr Tyr Leu Arg Lys Lys Val Ala Ser Lys
20 25 30

Arg Ile Glu Ile Asp Ile Ile Lys Asp Val Asp Leu Tyr Lys Ile Glu
35 40 45

Pro Cys Asp Leu Gln Glu Leu Cys Lys Ile Gly Asn Glu Glu Gln Ser
50 55 60

Glu Trp Tyr Phe Phe Ser His Lys Asp Lys Lys Tyr Pro Thr Gly Thr
65 70 75 80

Arg Thr Asn Arg Ala Thr Lys Ala Gly Phe Trp Lys Ala Thr Gly Arg
85 90 95

Asp Lys Ala Ile Tyr Ile Arg His Ser Leu Ile Gly Met Arg Lys Thr
100 105 110

Leu Val Phe Tyr Lys Gly Arg Ala Pro Asn Gly Gln Lys Ser Asp Trp
115 120 125

Ile Met His Glu Tyr Arg Leu Glu Thr Ser Glu Asn Gly Thr Pro Gln
130 135 140

Glu Glu Gly Trp Val Val Cys Arg Val Phe Lys Lys Lys Leu Ala Ala
145 150 155 160

Thr Val Arg Lys Met Gly Asp Tyr His Ser Ser Pro Ser Gln His Trp
165 170 175

Tyr Asp Asp Gln Leu Ser Phe Met Ala Ser Glu Ile Ile Ser Ser Ser
180 185 190

Pro Arg Gln Phe Leu Pro Asn His His Tyr Asn Arg His His His Gln
195 200 205

Gln Thr Leu Pro Cys Gly Leu Asn Ala Phe Asn Asn Asn Asn Pro Asn
210 215 220

Leu Gln Cys Lys Gln Glu Leu Glu Leu His Tyr Asn Gln Met Val Gln
225 230 235 240

His Gln Gln Gln Asn His His Leu Arg Glu Ser Met Phe Leu Gln Leu
245 250 255

Pro Gln Leu Glu Ser Pro Thr Ser Asn Cys Asn Ser Asp Asn Asn Asn
260 265 270

Asn Thr Arg Asn Ile Ser Asn Leu Gln Lys Ser Ser Asn Ile Ser His

```
        275                 280                 285

Glu Glu Gln Leu Gln Gln Gly Asn Gln Ser Phe Ser Ser Leu Tyr Tyr
    290                 295                 300

Asp Gln Gly Val Glu Gln Met Thr Thr Asp Trp Arg Val Leu Asp Lys
305                 310                 315                 320

Phe Val Ala Ser Gln Leu Ser Asn Asp Glu Glu Ala Ala Ala Val Val
                325                 330                 335

Ser Ser Ser Ser His Gln Asn Asn Val Lys Ile Asp Thr Arg Asn Thr
            340                 345                 350

Gly Tyr His Val Ile Asp Glu Gly Ile Asn Leu Pro Glu Asn Asp Ser
        355                 360                 365

Glu Arg Val Val Glu Met Gly Glu Glu Tyr Ser Asn Ala His Ala Ala
    370                 375                 380

Ser Thr Ser Ser Ser Cys Gln Ile Asp Leu
385                 390

<210>  263 <211>  927 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (1)..(927) <223>  G1782

 <400>  263
atg caa gtg ttt caa agg aaa gaa gat tca tct tgg gga aac tca atg       48
Met Gln Val Phe Gln Arg Lys Glu Asp Ser Ser Trp Gly Asn Ser Met
1               5                   10                  15

cct aca aca aat tca aat att caa gga tct gaa tct ttc agc ttg act       96
Pro Thr Thr Asn Ser Asn Ile Gln Gly Ser Glu Ser Phe Ser Leu Thr
            20                  25                  30

aag gat atg ata atg tct aca aca caa tta ccc gcg atg aaa cat tcg      144
Lys Asp Met Ile Met Ser Thr Thr Gln Leu Pro Ala Met Lys His Ser
        35                  40                  45

ggt ttg cag ctg caa aat caa gat tca acc tca tca caa tct act gaa      192
Gly Leu Gln Leu Gln Asn Gln Asp Ser Thr Ser Ser Gln Ser Thr Glu
    50                  55                  60

gaa gaa tca ggc ggc ggt gaa gtt gca agc ttt gga gaa tat aag cgt      240
Glu Glu Ser Gly Gly Gly Glu Val Ala Ser Phe Gly Glu Tyr Lys Arg
65                  70                  75                  80

tat gga tgc agc att gtt aat aac aat ctc tca ggt tac atc gaa aac      288
Tyr Gly Cys Ser Ile Val Asn Asn Asn Leu Ser Gly Tyr Ile Glu Asn
```

```
                85                  90                  95

ttg gga aag cct att gaa aat tat act aag tca att act acc tcg tcg      336
Leu Gly Lys Pro Ile Glu Asn Tyr Thr Lys Ser Ile Thr Thr Ser Ser
            100                 105                 110

atg gtg tct caa gac tct gtg ttt cct gct cct act tct ggt caa ata      384
Met Val Ser Gln Asp Ser Val Phe Pro Ala Pro Thr Ser Gly Gln Ile
        115                 120                 125

tct tgg tct ctt caa tgt gct gaa acg tca cat ttc aat ggt ttc ttg      432
Ser Trp Ser Leu Gln Cys Ala Glu Thr Ser His Phe Asn Gly Phe Leu
    130                 135                 140

gct cct gaa tat gca tca aca cca acg gcg ctg cca cat tta gag atg      480
Ala Pro Glu Tyr Ala Ser Thr Pro Thr Ala Leu Pro His Leu Glu Met
145                 150                 155                 160

atg ggt ttg gtt tct tca aga gtg cca ttg cct cat cac att caa gag      528
Met Gly Leu Val Ser Ser Arg Val Pro Leu Pro His His Ile Gln Glu
                165                 170                 175

aat gaa cca ata ttt gtc aat gcg aaa cag tat cat gcg att ctc cgt      576
Asn Glu Pro Ile Phe Val Asn Ala Lys Gln Tyr His Ala Ile Leu Arg
            180                 185                 190

cgc agg aag cac cgt gct aaa ctc gaa gct cag aac aaa ctc atc aaa      624
Arg Arg Lys His Arg Ala Lys Leu Glu Ala Gln Asn Lys Leu Ile Lys
        195                 200                 205

tgc cgt aaa ccg tac ctt cat gag tct cgc cat ctt cat gct tta aag      672
Cys Arg Lys Pro Tyr Leu His Glu Ser Arg His Leu His Ala Leu Lys
    210                 215                 220

aga gct aga ggc tcc ggt gga cgt ttc ctc aat aca aag aag ctt caa      720
Arg Ala Arg Gly Ser Gly Gly Arg Phe Leu Asn Thr Lys Lys Leu Gln
225                 230                 235                 240

gaa tca tca aac tca ctg tgt tct tct caa atg gca aat gga caa aat      768
Glu Ser Ser Asn Ser Leu Cys Ser Ser Gln Met Ala Asn Gly Gln Asn
                245                 250                 255

ttc tct atg agc cct cac ggt ggt gga agc gga atc ggg tct agt tcg      816
Phe Ser Met Ser Pro His Gly Gly Gly Ser Gly Ile Gly Ser Ser Ser
            260                 265                 270

atc tca ccg agc tcc aat tca aac tgt atc aac atg ttc caa aac ccg      864
Ile Ser Pro Ser Ser Asn Ser Asn Cys Ile Asn Met Phe Gln Asn Pro
        275                 280                 285

cag ttc aga ttc tca ggt tat ccg tca aca cac cat gcc tca gct ctc      912
Gln Phe Arg Phe Ser Gly Tyr Pro Ser Thr His His Ala Ser Ala Leu
    290                 295                 300

atg tca ggg act tga                                                  927
Met Ser Gly Thr
305
```

<210> 264 <211> 308 <212> PRT <213> Arabidopsis thaliana <400> 264

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Met Gln Val Phe Gln Arg Lys Glu Asp Ser Ser Trp Gly Asn Ser Met
1               5                  10                  15

Pro Thr Thr Asn Ser Asn Ile Gln Gly Ser Glu Ser Phe Ser Leu Thr
            20                  25                  30

Lys Asp Met Ile Met Ser Thr Thr Gln Leu Pro Ala Met Lys His Ser
        35                  40                  45

Gly Leu Gln Leu Gln Asn Gln Asp Ser Thr Ser Ser Gln Ser Thr Glu
    50                  55                  60

Glu Glu Ser Gly Gly Gly Glu Val Ala Ser Phe Gly Glu Tyr Lys Arg
65                  70                  75                  80

Tyr Gly Cys Ser Ile Val Asn Asn Asn Leu Ser Gly Tyr Ile Glu Asn
                85                  90                  95

Leu Gly Lys Pro Ile Glu Asn Tyr Thr Lys Ser Ile Thr Thr Ser Ser
            100                 105                 110

Met Val Ser Gln Asp Ser Val Phe Pro Ala Pro Thr Ser Gly Gln Ile
        115                 120                 125

Ser Trp Ser Leu Gln Cys Ala Glu Thr Ser His Phe Asn Gly Phe Leu
    130                 135                 140

Ala Pro Glu Tyr Ala Ser Thr Pro Thr Ala Leu Pro His Leu Glu Met
145                 150                 155                 160

Met Gly Leu Val Ser Ser Arg Val Pro Leu Pro His His Ile Gln Glu
                165                 170                 175

Asn Glu Pro Ile Phe Val Asn Ala Lys Gln Tyr His Ala Ile Leu Arg
            180                 185                 190

Arg Arg Lys His Arg Ala Lys Leu Glu Ala Gln Asn Lys Leu Ile Lys
        195                 200                 205

Cys Arg Lys Pro Tyr Leu His Glu Ser Arg His Leu His Ala Leu Lys
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210 215 220

Arg Ala Arg Gly Ser Gly Gly Arg Phe Leu Asn Thr Lys Lys Leu Gln
225 230 235 240

Glu Ser Ser Asn Ser Leu Cys Ser Ser Gln Met Ala Asn Gly Gln Asn
245 250 255

Phe Ser Met Ser Pro His Gly Gly Gly Ser Gly Ile Gly Ser Ser Ser
260 265 270

Ile Ser Pro Ser Ser Asn Ser Asn Cys Ile Asn Met Phe Gln Asn Pro
275 280 285

Gln Phe Arg Phe Ser Gly Tyr Pro Ser Thr His His Ala Ser Ala Leu
290 295 300

Met Ser Gly Thr
305

<210> 265 <211> 450 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (27)..(422) <223> G1795

<400> 265
acaaacacgc aaaaagtcat taatat atg gat caa gga ggt cga ggt gtc ggt 53
Met Asp Gln Gly Gly Arg Gly Val Gly
1 5

gcc gag cat gga aag tac cgg gga gtt cgg aga cga cct tgg gga aaa 101
Ala Glu His Gly Lys Tyr Arg Gly Val Arg Arg Arg Pro Trp Gly Lys
10 15 20 25

tat gca gca gag ata cga gat tcg agg aag cac ggt gaa cgt gtg tgg 149
Tyr Ala Ala Glu Ile Arg Asp Ser Arg Lys His Gly Glu Arg Val Trp
30 35 40

ctt gga acg ttc gat acg gca gag gaa gcg gct aga gcc tat gac caa 197
Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala Ala Arg Ala Tyr Asp Gln
45 50 55

gct gct tac tcc atg aga ggc caa gca gca atc ctt aac ttc cct cat 245
Ala Ala Tyr Ser Met Arg Gly Gln Ala Ala Ile Leu Asn Phe Pro His
60 65 70

gag tat aac atg ggg agt ggt gtc tct tct tcc acc gcc atg gct gga 293
Glu Tyr Asn Met Gly Ser Gly Val Ser Ser Ser Thr Ala Met Ala Gly
75 80 85

tct tcc tcc gcc tcc gcc tcc gct tct tct tct tct agg caa gtt ttt 341
Ser Ser Ser Ala Ser Ala Ser Ala Ser Ser Ser Ser Arg Gln Val Phe

90 95 100 105

gaa ttt gag tac ttg gat gat agt gtt ttg gag gag ctc ctt gag gaa 389
Glu Phe Glu Tyr Leu Asp Asp Ser Val Leu Glu Glu Leu Leu Glu Glu
110 115 120

gga gag aaa cct aac aag ggc aag aag aaa tga gcgagatata attcatgatt 442
Gly Glu Lys Pro Asn Lys Gly Lys Lys Lys
125 130

atttctaa 450

<210> 266 <211> 131 <212> PRT <213> Arabidopsis thaliana <400> 266

Met Asp Gln Gly Gly Arg Gly Val Gly Ala Glu His Gly Lys Tyr Arg
1 5 10 15

Gly Val Arg Arg Arg Pro Trp Gly Lys Tyr Ala Ala Glu Ile Arg Asp
20 25 30

Ser Arg Lys His Gly Glu Arg Val Trp Leu Gly Thr Phe Asp Thr Ala
35 40 45

Glu Glu Ala Ala Arg Ala Tyr Asp Gln Ala Ala Tyr Ser Met Arg Gly
50 55 60

Gln Ala Ala Ile Leu Asn Phe Pro His Glu Tyr Asn Met Gly Ser Gly
65 70 75 80

Val Ser Ser Ser Thr Ala Met Ala Gly Ser Ser Ser Ala Ser Ala Ser
85 90 95

Ala Ser Ser Ser Ser Arg Gln Val Phe Glu Phe Glu Tyr Leu Asp Asp
100 105 110

Ser Val Leu Glu Glu Leu Leu Glu Glu Gly Glu Lys Pro Asn Lys Gly
115 120 125

Lys Lys Lys
130

<210> 267 <211> 1716 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (169)..(1497) <223> G1804

<400> 267
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aaggaggaga acctccataa caagaagcgg attctctcag ttttccggcg gcggaggaac    120

acaaagccac cggtttttag acacacagat ttcattttca gttgttaa atg gta act     177
                                                      Met Val Thr
                                                      1

aga gaa acg aag ttg acg tca gag cga gaa gta gag tcg tcc atg gcg       225
Arg Glu Thr Lys Leu Thr Ser Glu Arg Glu Val Glu Ser Ser Met Ala
    5                   10                  15

caa gcg aga cat aat gga gga ggt ggt ggt gag aat cat ccg ttt act       273
Gln Ala Arg His Asn Gly Gly Gly Gly Gly Glu Asn His Pro Phe Thr
20                  25                  30                  35

tct ttg gga aga caa tcc tct atc tac tca ttg acc ctt gac gag ttc       321
Ser Leu Gly Arg Gln Ser Ser Ile Tyr Ser Leu Thr Leu Asp Glu Phe
                40                  45                  50

caa cat gct tta tgt gag aac ggc aag aac ttt ggg tcc atg aac atg       369
Gln His Ala Leu Cys Glu Asn Gly Lys Asn Phe Gly Ser Met Asn Met
            55                  60                  65

gac gag ttt ctt gtc tct att tgg aac gca gag gag aat aat aac aat       417
Asp Glu Phe Leu Val Ser Ile Trp Asn Ala Glu Glu Asn Asn Asn Asn
        70                  75                  80

caa caa caa gca gca gca gct gca ggt tca cat tct gtt ccg gct aat       465
Gln Gln Gln Ala Ala Ala Ala Ala Gly Ser His Ser Val Pro Ala Asn
    85                  90                  95

cac aat ggt ttc aac aac aac aat aac aat gga ggc gag ggt ggt gtt       513
His Asn Gly Phe Asn Asn Asn Asn Asn Asn Gly Gly Glu Gly Gly Val
100                 105                 110                 115

ggt gtc ttt agt ggt ggt tct aga ggc aac gaa gat gct aac aat aag       561
Gly Val Phe Ser Gly Gly Ser Arg Gly Asn Glu Asp Ala Asn Asn Lys
                120                 125                 130

aga ggg ata gcg aac gag tct agt ctt cct cga caa ggc tct ttg aca       609
Arg Gly Ile Ala Asn Glu Ser Ser Leu Pro Arg Gln Gly Ser Leu Thr
            135                 140                 145

ctt cca gct ccg ctt tgt agg aag act gtt gat gag gtt tgg tct gag       657
Leu Pro Ala Pro Leu Cys Arg Lys Thr Val Asp Glu Val Trp Ser Glu
        150                 155                 160

ata cat aga ggt ggt ggt agc ggt aat gga gga gac agc aat gga cgt       705
Ile His Arg Gly Gly Gly Ser Gly Asn Gly Gly Asp Ser Asn Gly Arg
    165                 170                 175

agt agt agt agt aat gga cag aac aat gct cag aac ggc ggt gag act       753
Ser Ser Ser Ser Asn Gly Gln Asn Asn Ala Gln Asn Gly Gly Glu Thr
180                 185                 190                 195

gcg gct aga caa ccg act ttt gga gag atg aca ctt gag gat ttc ttg       801
Ala Ala Arg Gln Pro Thr Phe Gly Glu Met Thr Leu Glu Asp Phe Leu
                200                 205                 210
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gtg aag gct ggt gtg gtt aga gaa cat ccc act aat cct aaa cct aat      849
Val Lys Ala Gly Val Val Arg Glu His Pro Thr Asn Pro Lys Pro Asn
            215                 220                 225

cca aac ccg aac caa aac caa aac ccg tct agt gta ata ccc gca gct      897
Pro Asn Pro Asn Gln Asn Gln Asn Pro Ser Ser Val Ile Pro Ala Ala
        230                 235                 240

gca cag caa cag ctt tat ggt gtg ttt caa gga acc ggt gat cct tca      945
Ala Gln Gln Gln Leu Tyr Gly Val Phe Gln Gly Thr Gly Asp Pro Ser
    245                 250                 255

ttc ccg ggt caa gct atg ggt gtg ggt gac cca tca ggt tat gct aaa      993
Phe Pro Gly Gln Ala Met Gly Val Gly Asp Pro Ser Gly Tyr Ala Lys
260                 265                 270                 275

agg aca gga gga gga ggg tat cag cag gcg cca cca gtt cag gca ggt     1041
Arg Thr Gly Gly Gly Gly Tyr Gln Gln Ala Pro Pro Val Gln Ala Gly
                280                 285                 290

gtt tgc tat gga ggt ggc gtt ggg ttt gga gcg ggt gga cag caa atg     1089
Val Cys Tyr Gly Gly Gly Val Gly Phe Gly Ala Gly Gly Gln Gln Met
            295                 300                 305

gga atg gtt gga ccg tta agc ccg gtg tct tca gat gga tta gga cat     1137
Gly Met Val Gly Pro Leu Ser Pro Val Ser Ser Asp Gly Leu Gly His
        310                 315                 320

gga caa gtg gat aac ata gga ggt cag tat gga gta gat atg gga ggg     1185
Gly Gln Val Asp Asn Ile Gly Gly Gln Tyr Gly Val Asp Met Gly Gly
    325                 330                 335

cta agg gga agg aaa aga gta gtg gat ggt cca gtg gag aaa gta gtg     1233
Leu Arg Gly Arg Lys Arg Val Val Asp Gly Pro Val Glu Lys Val Val
340                 345                 350                 355

gag aga aga cag agg agg atg atc aag aac cgc gag tct gct gct aga     1281
Glu Arg Arg Gln Arg Arg Met Ile Lys Asn Arg Glu Ser Ala Ala Arg
                360                 365                 370

tct aga gca aga aaa caa gca tat aca gtg gaa ttg gaa gct gaa ctt     1329
Ser Arg Ala Arg Lys Gln Ala Tyr Thr Val Glu Leu Glu Ala Glu Leu
            375                 380                 385

aac cag ttg aaa gaa gag aat gcg cag cta aaa cat gca ttg gcg gag     1377
Asn Gln Leu Lys Glu Glu Asn Ala Gln Leu Lys His Ala Leu Ala Glu
        390                 395                 400

ttg gag agg aag agg aag caa cag tat ttt gag agt ttg aag tca agg     1425
Leu Glu Arg Lys Arg Lys Gln Gln Tyr Phe Glu Ser Leu Lys Ser Arg
    405                 410                 415

gca caa ccg aaa ttg ccg aaa tcg aac ggg aga ttg cgg aca ttg atg     1473
Ala Gln Pro Lys Leu Pro Lys Ser Asn Gly Arg Leu Arg Thr Leu Met
420                 425                 430                 435
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agg aac ccg agt tgt cca ctc taa acaaacaata ggaagatgga gaagaagtcg 1527
Arg Asn Pro Ser Cys Pro Leu
440

gagacagaac gagggaaaaa ctgatgattt tctacgttgt tgttttgtct ttgaggaatg 1587

aggttataga atctttatac tttgatgttt tctgtgttgg taggaggaac accatctgat 1647

ctgctttact agtgttccct gtgaacaaag aaagtgattc tgtgtttcaa catcatcaat 1707

ctttggaaa 1716

<210> 268 <211> 442 <212> PRT <213> Arabidopsis thaliana <400> 268

Met Val Thr Arg Glu Thr Lys Leu Thr Ser Glu Arg Glu Val Glu Ser
1 5 10 15

Ser Met Ala Gln Ala Arg His Asn Gly Gly Gly Gly Gly Glu Asn His
20 25 30

Pro Phe Thr Ser Leu Gly Arg Gln Ser Ser Ile Tyr Ser Leu Thr Leu
35 40 45

Asp Glu Phe Gln His Ala Leu Cys Glu Asn Gly Lys Asn Phe Gly Ser
50 55 60

Met Asn Met Asp Glu Phe Leu Val Ser Ile Trp Asn Ala Glu Glu Asn
65 70 75 80

Asn Asn Asn Gln Gln Gln Ala Ala Ala Ala Ala Gly Ser His Ser Val
85 90 95

Pro Ala Asn His Asn Gly Phe Asn Asn Asn Asn Asn Asn Gly Gly Glu
100 105 110

Gly Gly Val Gly Val Phe Ser Gly Gly Ser Arg Gly Asn Glu Asp Ala
115 120 125

Asn Asn Lys Arg Gly Ile Ala Asn Glu Ser Ser Leu Pro Arg Gln Gly
130 135 140

Ser Leu Thr Leu Pro Ala Pro Leu Cys Arg Lys Thr Val Asp Glu Val
145 150 155 160

Trp Ser Glu Ile His Arg Gly Gly Gly Ser Gly Asn Gly Gly Asp Ser
165 170 175

Asn Gly Arg Ser Ser Ser Ser Asn Gly Gln Asn Asn Ala Gln Asn Gly
180 185 190

Gly Glu Thr Ala Ala Arg Gln Pro Thr Phe Gly Glu Met Thr Leu Glu
195 200 205

Asp Phe Leu Val Lys Ala Gly Val Val Arg Glu His Pro Thr Asn Pro
210 215 220

Lys Pro Asn Pro Asn Pro Asn Gln Asn Gln Asn Pro Ser Ser Val Ile
225 230 235 240

Pro Ala Ala Ala Gln Gln Gln Leu Tyr Gly Val Phe Gln Gly Thr Gly
245 250 255

Asp Pro Ser Phe Pro Gly Gln Ala Met Gly Val Gly Asp Pro Ser Gly
260 265 270

Tyr Ala Lys Arg Thr Gly Gly Gly Gly Tyr Gln Gln Ala Pro Pro Val
275 280 285

Gln Ala Gly Val Cys Tyr Gly Gly Gly Val Gly Phe Gly Ala Gly Gly
290 295 300

Gln Gln Met Gly Met Val Gly Pro Leu Ser Pro Val Ser Ser Asp Gly
305 310 315 320

Leu Gly His Gly Gln Val Asp Asn Ile Gly Gly Gln Tyr Gly Val Asp
325 330 335

Met Gly Gly Leu Arg Gly Arg Lys Arg Val Val Asp Gly Pro Val Glu
340 345 350

Lys Val Val Glu Arg Arg Gln Arg Arg Met Ile Lys Asn Arg Glu Ser
355 360 365

Ala Ala Arg Ser Arg Ala Arg Lys Gln Ala Tyr Thr Val Glu Leu Glu
370 375 380

Ala Glu Leu Asn Gln Leu Lys Glu Glu Asn Ala Gln Leu Lys His Ala
385 390 395 400

Leu Ala Glu Leu Glu Arg Lys Arg Lys Gln Gln Tyr Phe Glu Ser Leu
405 410 415

Lys Ser Arg Ala Gln Pro Lys Leu Pro Lys Ser Asn Gly Arg Leu Arg
420 425 430

Thr Leu Met Arg Asn Pro Ser Cys Pro Leu
435 440

<210> 269 <211> 1662 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1662) <223> G1807

<400> 269

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atg ggt gat aca gag aag tgt aac agt gat atg atc cag aga ctt cat      48
Met Gly Asp Thr Glu Lys Cys Asn Ser Asp Met Ile Gln Arg Leu His
1               5                   10                  15

tca tct ttc ggc act act tct tct tcc att ccc aaa aat ccc att tct      96
Ser Ser Phe Gly Thr Thr Ser Ser Ser Ile Pro Lys Asn Pro Ile Ser
            20                  25                  30

cag ctc gat tta aac cct aat ttc atc cgc tca tca gct cct caa ttc     144
Gln Leu Asp Leu Asn Pro Asn Phe Ile Arg Ser Ser Ala Pro Gln Phe
        35                  40                  45

tcc aag cct ttc agt gac agt ggc aaa cga atc ggt gtt cct ccg tcg     192
Ser Lys Pro Phe Ser Asp Ser Gly Lys Arg Ile Gly Val Pro Pro Ser
    50                  55                  60

cac ccc aac tta atc cca ccg act tct ccg ttt tct cag atc ccg acc     240
His Pro Asn Leu Ile Pro Pro Thr Ser Pro Phe Ser Gln Ile Pro Thr
65                  70                  75                  80

acc cga caa ccc ggt tcg cat aat ttt aac ccg gga gga gct aat cat     288
Thr Arg Gln Pro Gly Ser His Asn Phe Asn Pro Gly Gly Ala Asn His
                85                  90                  95

tca cgg tca atg tca cag ccc aac tct ttc ttc tct ttt gac tcc tta     336
Ser Arg Ser Met Ser Gln Pro Asn Ser Phe Phe Ser Phe Asp Ser Leu
            100                 105                 110

cct ccg tta agc cct tct ccg ttt cga gat cac gat gtt tca atg gag     384
Pro Pro Leu Ser Pro Ser Pro Phe Arg Asp His Asp Val Ser Met Glu
        115                 120                 125

gat aga gat tcc ggc gtg ttt aac agc aac cat tcg ttg cct cca tcg     432
Asp Arg Asp Ser Gly Val Phe Asn Ser Asn His Ser Leu Pro Pro Ser
    130                 135                 140

ccg ttc acg agg tgt aat tcg acc tct tct agc tcc ttg aga gtc ggt     480
Pro Phe Thr Arg Cys Asn Ser Thr Ser Ser Ser Ser Leu Arg Val Gly
145                 150                 155                 160
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gag agt tta cct ccg aga aag tct cat aga cgc tcc aac agt gat atc      528
Glu Ser Leu Pro Pro Arg Lys Ser His Arg Arg Ser Asn Ser Asp Ile
                165                 170                 175

ccc agt ggg ttt aat tcg atg cct ttg atc cct ccg aga cca ttg gag      576
Pro Ser Gly Phe Asn Ser Met Pro Leu Ile Pro Pro Arg Pro Leu Glu
            180                 185                 190

agg tct ttt tct ggt ggg gag tgt gct gat tgg tca aag tct aat cct      624
Arg Ser Phe Ser Gly Gly Glu Cys Ala Asp Trp Ser Lys Ser Asn Pro
        195                 200                 205

ttt gtg aag aag gaa tcg agc tgc gaa agg gaa ggt gtc gga gag aga      672
Phe Val Lys Lys Glu Ser Ser Cys Glu Arg Glu Gly Val Gly Glu Arg
    210                 215                 220

gaa gct atg gat gat ctc ttc tca gca tat atg aat ctt gaa aac att      720
Glu Ala Met Asp Asp Leu Phe Ser Ala Tyr Met Asn Leu Glu Asn Ile
225                 230                 235                 240

gat gtg ttg aac tcc tct gaa gct gat gat agc aag aac ggt aat gag      768
Asp Val Leu Asn Ser Ser Glu Ala Asp Asp Ser Lys Asn Gly Asn Glu
                245                 250                 255

aat agg gat gat atg gag agc agc aga gca agc ggg acc aag act aac      816
Asn Arg Asp Asp Met Glu Ser Ser Arg Ala Ser Gly Thr Lys Thr Asn
            260                 265                 270

ggt agt gat acg gaa gga gag agc agc agt gtc aat gag agt gcc aat      864
Gly Ser Asp Thr Glu Gly Glu Ser Ser Ser Val Asn Glu Ser Ala Asn
        275                 280                 285

aat aat atg aat tct tct ggt gaa aag aga gag agc gtg aag aga aga      912
Asn Asn Met Asn Ser Ser Gly Glu Lys Arg Glu Ser Val Lys Arg Arg
    290                 295                 300

gcg gct gga gga gat att gct cct acc acc aga cat tac agg agt gtt      960
Ala Ala Gly Gly Asp Ile Ala Pro Thr Thr Arg His Tyr Arg Ser Val
305                 310                 315                 320

tca gtg gac agt tgt ttc atg gag aag ttg tct ttt ggt gat gaa tct     1008
Ser Val Asp Ser Cys Phe Met Glu Lys Leu Ser Phe Gly Asp Glu Ser
                325                 330                 335

cta aag ccg cct cct tct cct gga tct atg tca agg aaa gtt tcc cct     1056
Leu Lys Pro Pro Pro Ser Pro Gly Ser Met Ser Arg Lys Val Ser Pro
            340                 345                 350

acc aat tcg gtt gat ggg aac tcg ggt gct gct ttt agc atc gag ttc     1104
Thr Asn Ser Val Asp Gly Asn Ser Gly Ala Ala Phe Ser Ile Glu Phe
        355                 360                 365

aat aac ggt gag ttt act gca gcg gaa atg aag aag atc atg gca aat     1152
Asn Asn Gly Glu Phe Thr Ala Ala Glu Met Lys Lys Ile Met Ala Asn
    370                 375                 380

gat aaa cta gca gag atg gcc atg tct gac cct aaa cgt gtc aaa agg     1200
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Asp Lys Leu Ala Glu Met Ala Met Ser Asp Pro Lys Arg Val Lys Arg
385                 390                 395                 400

aat gat cct ctt ttc aga atc tta gcg aac cgt caa tcc gca gca cgg     1248
Asn Asp Pro Leu Phe Arg Ile Leu Ala Asn Arg Gln Ser Ala Ala Arg
                405                 410                 415

tca aag gag agg aag atg cgg tac ata gta gaa ttg gaa cac aaa gtg     1296
Ser Lys Glu Arg Lys Met Arg Tyr Ile Val Glu Leu Glu His Lys Val
            420                 425                 430

cag act ctt cag acc gag gct acc aca ttg tct gct cag ctc aca ctt     1344
Gln Thr Leu Gln Thr Glu Ala Thr Thr Leu Ser Ala Gln Leu Thr Leu
        435                 440                 445

ttg cag cgc gat atg atg ggg ttg aca aat cag aac aat gag ctt aag     1392
Leu Gln Arg Asp Met Met Gly Leu Thr Asn Gln Asn Asn Glu Leu Lys
    450                 455                 460

ttc cgg ctt caa gca atg gag caa caa gcg cgt ctt cgc gat gct ctg     1440
Phe Arg Leu Gln Ala Met Glu Gln Gln Ala Arg Leu Arg Asp Ala Leu
465                 470                 475                 480

aac gaa gca ctg aat gga gaa gtc cag cga ctg aaa ctg gca atc ggt     1488
Asn Glu Ala Leu Asn Gly Glu Val Gln Arg Leu Lys Leu Ala Ile Gly
                485                 490                 495

gag agc agt cag aac gaa tca gag aga tca aag atg caa tca ctc aac     1536
Glu Ser Ser Gln Asn Glu Ser Glu Arg Ser Lys Met Gln Ser Leu Asn
            500                 505                 510

gct gag atg ttc cag caa ctc aac atc agc cag tta aga cag cag cca     1584
Ala Glu Met Phe Gln Gln Leu Asn Ile Ser Gln Leu Arg Gln Gln Pro
        515                 520                 525

caa cag atg cag caa cag tct cat cag cag aac cac cag aat gga acc     1632
Gln Gln Met Gln Gln Gln Ser His Gln Gln Asn His Gln Asn Gly Thr
    530                 535                 540

atg gca aca aaa tct gaa tca aat gaa tag                             1662
Met Ala Thr Lys Ser Glu Ser Asn Glu
545                 550

<210>  270 <211>  553 <212>  PRT <213>  Arabidopsis thaliana  <400>  270

Met Gly Asp Thr Glu Lys Cys Asn Ser Asp Met Ile Gln Arg Leu His
1               5                   10                  15

Ser Ser Phe Gly Thr Thr Ser Ser Ser Ile Pro Lys Asn Pro Ile Ser
            20                  25                  30

Gln Leu Asp Leu Asn Pro Asn Phe Ile Arg Ser Ser Ala Pro Gln Phe
        35                  40                  45
```

Ser Lys Pro Phe Ser Asp Ser Gly Lys Arg Ile Gly Val Pro Pro Ser
50 55 60

His Pro Asn Leu Ile Pro Pro Thr Ser Pro Phe Ser Gln Ile Pro Thr
65 70 75 80

Thr Arg Gln Pro Gly Ser His Asn Phe Asn Pro Gly Gly Ala Asn His
85 90 95

Ser Arg Ser Met Ser Gln Pro Asn Ser Phe Phe Ser Phe Asp Ser Leu
100 105 110

Pro Pro Leu Ser Pro Ser Pro Phe Arg Asp His Asp Val Ser Met Glu
115 120 125

Asp Arg Asp Ser Gly Val Phe Asn Ser Asn His Ser Leu Pro Pro Ser
130 135 140

Pro Phe Thr Arg Cys Asn Ser Thr Ser Ser Ser Ser Leu Arg Val Gly
145 150 155 160

Glu Ser Leu Pro Pro Arg Lys Ser His Arg Arg Ser Asn Ser Asp Ile
165 170 175

Pro Ser Gly Phe Asn Ser Met Pro Leu Ile Pro Pro Arg Pro Leu Glu
180 185 190

Arg Ser Phe Ser Gly Gly Glu Cys Ala Asp Trp Ser Lys Ser Asn Pro
195 200 205

Phe Val Lys Lys Glu Ser Ser Cys Glu Arg Glu Gly Val Gly Glu Arg
210 215 220

Glu Ala Met Asp Asp Leu Phe Ser Ala Tyr Met Asn Leu Glu Asn Ile
225 230 235 240

Asp Val Leu Asn Ser Ser Glu Ala Asp Asp Ser Lys Asn Gly Asn Glu
245 250 255

Asn Arg Asp Asp Met Glu Ser Ser Arg Ala Ser Gly Thr Lys Thr Asn
260 265 270

Gly Ser Asp Thr Glu Gly Glu Ser Ser Ser Val Asn Glu Ser Ala Asn
275 280 285

Asn Asn Met Asn Ser Ser Gly Glu Lys Arg Glu Ser Val Lys Arg Arg
290 295 300

Ala Ala Gly Gly Asp Ile Ala Pro Thr Thr Arg His Tyr Arg Ser Val
305 310 315 320

Ser Val Asp Ser Cys Phe Met Glu Lys Leu Ser Phe Gly Asp Glu Ser
325 330 335

Leu Lys Pro Pro Pro Ser Pro Gly Ser Met Ser Arg Lys Val Ser Pro
340 345 350

Thr Asn Ser Val Asp Gly Asn Ser Gly Ala Ala Phe Ser Ile Glu Phe
355 360 365

Asn Asn Gly Glu Phe Thr Ala Ala Glu Met Lys Lys Ile Met Ala Asn
370 375 380

Asp Lys Leu Ala Glu Met Ala Met Ser Asp Pro Lys Arg Val Lys Arg
385 390 395 400

Asn Asp Pro Leu Phe Arg Ile Leu Ala Asn Arg Gln Ser Ala Ala Arg
405 410 415

Ser Lys Glu Arg Lys Met Arg Tyr Ile Val Glu Leu Glu His Lys Val
420 425 430

Gln Thr Leu Gln Thr Glu Ala Thr Thr Leu Ser Ala Gln Leu Thr Leu
435 440 445

Leu Gln Arg Asp Met Met Gly Leu Thr Asn Gln Asn Asn Glu Leu Lys
450 455 460

Phe Arg Leu Gln Ala Met Glu Gln Gln Ala Arg Leu Arg Asp Ala Leu
465 470 475 480

Asn Glu Ala Leu Asn Gly Glu Val Gln Arg Leu Lys Leu Ala Ile Gly
485 490 495

Glu Ser Ser Gln Asn Glu Ser Glu Arg Ser Lys Met Gln Ser Leu Asn

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            500                 505                 510

Ala Glu Met Phe Gln Gln Leu Asn Ile Ser Gln Leu Arg Gln Gln Pro
        515                 520                 525

Gln Gln Met Gln Gln Gln Ser His Gln Gln Asn His Gln Asn Gly Thr
    530                 535                 540

Met Ala Thr Lys Ser Glu Ser Asn Glu
545                 550
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<210> 271 <211> 969 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (1)..(969) <223> G1835

<400> 271

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atg att gga aca agc ttc ccc gag gat ctt gat tgt ggc aac ttc ttt      48
Met Ile Gly Thr Ser Phe Pro Glu Asp Leu Asp Cys Gly Asn Phe Phe
1               5                   10                  15

gac aac atg gat gat ctc atg gac ttt ccc ggt gga gat atc gat gtc      96
Asp Asn Met Asp Asp Leu Met Asp Phe Pro Gly Gly Asp Ile Asp Val
            20                  25                  30

ggt ttc ggc ata ggt gac tcc gac tct ttc cct acc atc tgg acc act     144
Gly Phe Gly Ile Gly Asp Ser Asp Ser Phe Pro Thr Ile Trp Thr Thr
        35                  40                  45

cat cac gac acg tgg cct gcc gct tct gat cct ctc ttc tct tcc aac     192
His His Asp Thr Trp Pro Ala Ala Ser Asp Pro Leu Phe Ser Ser Asn
    50                  55                  60

acc aac tct gat tca tca cct gag ctc tat gtt ccg ttt gag gac att     240
Thr Asn Ser Asp Ser Ser Pro Glu Leu Tyr Val Pro Phe Glu Asp Ile
65                  70                  75                  80

gtt aag gtg gaa aga cct cca agc ttt gta gag gaa aca ttg gtt gag     288
Val Lys Val Glu Arg Pro Pro Ser Phe Val Glu Glu Thr Leu Val Glu
                85                  90                  95

aag aag gaa gat tcg ttt tcg aca aac act gat tca tca tct tct cat     336
Lys Lys Glu Asp Ser Phe Ser Thr Asn Thr Asp Ser Ser Ser Ser His
            100                 105                 110

agc caa ttc agg agc tca agt cca gtg tcg gtt ctc gag agc agc tcc     384
Ser Gln Phe Arg Ser Ser Ser Pro Val Ser Val Leu Glu Ser Ser Ser
        115                 120                 125

tcc tcg tct caa acc acc aac aca acc tcc ctt gtt ctc cct gga aag     432
Ser Ser Ser Gln Thr Thr Asn Thr Thr Ser Leu Val Leu Pro Gly Lys
    130                 135                 140

cac ggt cgt cca cgc aca aaa cgc cct cgt cca cct gtc cag gat aaa     480
His Gly Arg Pro Arg Thr Lys Arg Pro Arg Pro Pro Val Gln Asp Lys
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145                 150                 155                 160

gat aga gtc aaa gac aat gtg tgc ggt ggt gac tcg cgc ctc atc att      528
Asp Arg Val Lys Asp Asn Val Cys Gly Gly Asp Ser Arg Leu Ile Ile
                165                 170                 175

aga ata ccg aaa cag ttt ctc tct gat cac aac aag atg atc aac aag      576
Arg Ile Pro Lys Gln Phe Leu Ser Asp His Asn Lys Met Ile Asn Lys
            180                 185                 190

aag aag aag aag aag gcc aag att act tct tcc tct tct tcg tcc ggg      624
Lys Lys Lys Lys Lys Ala Lys Ile Thr Ser Ser Ser Ser Ser Ser Gly
        195                 200                 205

att gat ctt gaa gtc aat gga aac aac gtc gat tcg tat tct tca gag      672
Ile Asp Leu Glu Val Asn Gly Asn Asn Val Asp Ser Tyr Ser Ser Glu
    210                 215                 220

caa tat ccg ctt agg aaa tgt atg cac tgt gag gtc acc aag act cca      720
Gln Tyr Pro Leu Arg Lys Cys Met His Cys Glu Val Thr Lys Thr Pro
225                 230                 235                 240

cag tgg agg ctt ggt cca atg ggt cca aag aca ctt tgc aat gcg tgc      768
Gln Trp Arg Leu Gly Pro Met Gly Pro Lys Thr Leu Cys Asn Ala Cys
                245                 250                 255

ggt gta cgt tac aaa tca ggg agg ctt ttc ccg gag tac cgt cca gct      816
Gly Val Arg Tyr Lys Ser Gly Arg Leu Phe Pro Glu Tyr Arg Pro Ala
            260                 265                 270

gct agt cca aca ttt act cca gct ctt cac tca aac tca cac aag aaa      864
Ala Ser Pro Thr Phe Thr Pro Ala Leu His Ser Asn Ser His Lys Lys
        275                 280                 285

gtg gct gaa atg aga aac aag aga tgc agt gat ggt agc tac ata acc      912
Val Ala Glu Met Arg Asn Lys Arg Cys Ser Asp Gly Ser Tyr Ile Thr
    290                 295                 300

gaa gag aat gat ctg caa ggg ctg att ccg aac aat gcc tac att ggc      960
Glu Glu Asn Asp Leu Gln Gly Leu Ile Pro Asn Asn Ala Tyr Ile Gly
305                 310                 315                 320

gta gac taa                                                         969
Val Asp
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<210> 272 <211> 322 <212> PRT <213> Arabidopsis thaliana <400> 272

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Met Ile Gly Thr Ser Phe Pro Glu Asp Leu Asp Cys Gly Asn Phe Phe
1               5                   10                  15

Asp Asn Met Asp Asp Leu Met Asp Phe Pro Gly Gly Asp Ile Asp Val
            20                  25                  30
```

Gly Phe Gly Ile Gly Asp Ser Asp Ser Phe Pro Thr Ile Trp Thr Thr
35 40 45

His His Asp Thr Trp Pro Ala Ala Ser Asp Pro Leu Phe Ser Ser Asn
50 55 60

Thr Asn Ser Asp Ser Ser Pro Glu Leu Tyr Val Pro Phe Glu Asp Ile
65 70 75 80

Val Lys Val Glu Arg Pro Pro Ser Phe Val Glu Glu Thr Leu Val Glu
85 90 95

Lys Lys Glu Asp Ser Phe Ser Thr Asn Thr Asp Ser Ser Ser Ser His
100 105 110

Ser Gln Phe Arg Ser Ser Ser Pro Val Ser Val Leu Glu Ser Ser Ser
115 120 125

Ser Ser Ser Gln Thr Thr Asn Thr Thr Ser Leu Val Leu Pro Gly Lys
130 135 140

His Gly Arg Pro Arg Thr Lys Arg Pro Arg Pro Pro Val Gln Asp Lys
145 150 155 160

Asp Arg Val Lys Asp Asn Val Cys Gly Gly Asp Ser Arg Leu Ile Ile
165 170 175

Arg Ile Pro Lys Gln Phe Leu Ser Asp His Asn Lys Met Ile Asn Lys
180 185 190

Lys Lys Lys Lys Lys Ala Lys Ile Thr Ser Ser Ser Ser Ser Ser Gly
195 200 205

Ile Asp Leu Glu Val Asn Gly Asn Asn Val Asp Ser Tyr Ser Ser Glu
210 215 220

Gln Tyr Pro Leu Arg Lys Cys Met His Cys Glu Val Thr Lys Thr Pro
225 230 235 240

Gln Trp Arg Leu Gly Pro Met Gly Pro Lys Thr Leu Cys Asn Ala Cys
245 250 255

Gly Val Arg Tyr Lys Ser Gly Arg Leu Phe Pro Glu Tyr Arg Pro Ala

260 265 270

Ala Ser Pro Thr Phe Thr Pro Ala Leu His Ser Asn Ser His Lys Lys
275 280 285

Val Ala Glu Met Arg Asn Lys Arg Cys Ser Asp Gly Ser Tyr Ile Thr
290 295 300

Glu Glu Asn Asp Leu Gln Gly Leu Ile Pro Asn Asn Ala Tyr Ile Gly
305 310 315 320

Val Asp

09354835 - 09354835

<210> 273 <211> 668 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (47)..(610) <223> G1836

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ataacaagcc tagaacacta gaaacttcaa aaaagaaaaa aatctt atg gag aac 55
Met Glu Asn
1

aac aac ggc aac aac cag ctg cca ccg aaa ggt aac gag caa ctg aag 103
Asn Asn Gly Asn Asn Gln Leu Pro Pro Lys Gly Asn Glu Gln Leu Lys
5 10 15

agt ttc tgg tca aaa gag atg gaa ggt aac tta gat ttc aaa aat cac 151
Ser Phe Trp Ser Lys Glu Met Glu Gly Asn Leu Asp Phe Lys Asn His
20 25 30 35

gac ctt cct ata act cgt atc aag aag att atg aag tat gat ccg gat 199
Asp Leu Pro Ile Thr Arg Ile Lys Lys Ile Met Lys Tyr Asp Pro Asp
40 45 50

gtg act atg ata gct agt gag gct cca atc ctc ctc tcg aaa gca tgt 247
Val Thr Met Ile Ala Ser Glu Ala Pro Ile Leu Leu Ser Lys Ala Cys
55 60 65

gag atg ttt atc atg gat ctc acg atg cgt tcg tgg ctc cat gct cag 295
Glu Met Phe Ile Met Asp Leu Thr Met Arg Ser Trp Leu His Ala Gln
70 75 80

gaa agc aaa cga gtc acg cta cag aaa tct aat gtc gat gcc gca gtg 343
Glu Ser Lys Arg Val Thr Leu Gln Lys Ser Asn Val Asp Ala Ala Val
85 90 95

gct caa act gtt atc ttt gat ttc ttg ctt gat gat gac att gag gta 391
Ala Gln Thr Val Ile Phe Asp Phe Leu Leu Asp Asp Asp Ile Glu Val
100 105 110 115

aag aga gag tct gtt gcc gcc gct gct gat cct gtg gcc atg cca cct 439
Lys Arg Glu Ser Val Ala Ala Ala Ala Asp Pro Val Ala Met Pro Pro

```
                120                 125                 130

att gac gat gga gag ctg cct cca gga atg gta att gga act cct gtt      487
Ile Asp Asp Gly Glu Leu Pro Pro Gly Met Val Ile Gly Thr Pro Val
            135                 140                 145

tgt tgt agt ctt gga atc cac caa cca caa cca caa atg cag gca tgg      535
Cys Cys Ser Leu Gly Ile His Gln Pro Gln Pro Gln Met Gln Ala Trp
        150                 155                 160

cct gga gct tgg acc tcg gtg tct ggt gag gag gaa gaa gcg cgt ggg      583
Pro Gly Ala Trp Thr Ser Val Ser Gly Glu Glu Glu Glu Ala Arg Gly
    165                 170                 175

aaa aaa gga ggt gac gac gga aac taa taagtggaat acgttttagg            630
Lys Lys Gly Gly Asp Asp Gly Asn
180                 185

gtattttcaa gggaatatgt agtaaatagt catggatc                           668


<210>  274 <211>  187 <212>  PRT <213>  Arabidopsis thaliana  <400>  274

Met Glu Asn Asn Asn Gly Asn Asn Gln Leu Pro Pro Lys Gly Asn Glu
1               5                   10                  15

Gln Leu Lys Ser Phe Trp Ser Lys Glu Met Glu Gly Asn Leu Asp Phe
            20                  25                  30

Lys Asn His Asp Leu Pro Ile Thr Arg Ile Lys Lys Ile Met Lys Tyr
        35                  40                  45

Asp Pro Asp Val Thr Met Ile Ala Ser Glu Ala Pro Ile Leu Leu Ser
    50                  55                  60

Lys Ala Cys Glu Met Phe Ile Met Asp Leu Thr Met Arg Ser Trp Leu
65                  70                  75                  80

His Ala Gln Glu Ser Lys Arg Val Thr Leu Gln Lys Ser Asn Val Asp
                85                  90                  95

Ala Ala Val Ala Gln Thr Val Ile Phe Asp Phe Leu Leu Asp Asp Asp
            100                 105                 110

Ile Glu Val Lys Arg Glu Ser Val Ala Ala Ala Ala Asp Pro Val Ala
        115                 120                 125

Met Pro Pro Ile Asp Asp Gly Glu Leu Pro Pro Gly Met Val Ile Gly
    130                 135                 140
```

```
Thr Pro Val Cys Cys Ser Leu Gly Ile His Gln Pro Gln Pro Gln Met
145                 150                 155                 160

Gln Ala Trp Pro Gly Ala Trp Thr Ser Val Ser Gly Glu Glu Glu Glu
                165                 170                 175

Ala Arg Gly Lys Lys Gly Gly Asp Asp Gly Asn
            180                 185
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<210> 275 <211> 897 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(897) <223> G1900

<400> 275

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atg ctg gaa act aaa gat cct gcg ata aag ctc ttt ggt atg aaa att       48
Met Leu Glu Thr Lys Asp Pro Ala Ile Lys Leu Phe Gly Met Lys Ile
1               5                   10                  15

cct ttc ccg acg gtt tta gag gtt gct gat gaa gaa gaa gaa aag aac       96
Pro Phe Pro Thr Val Leu Glu Val Ala Asp Glu Glu Glu Glu Lys Asn
            20                  25                  30

caa aac aag aca tta act gat caa tcg gag aaa gac aaa acc cta aag      144
Gln Asn Lys Thr Leu Thr Asp Gln Ser Glu Lys Asp Lys Thr Leu Lys
        35                  40                  45

aaa cca acc aag att ctt cca tgt cca aga tgc aac agc atg gag act      192
Lys Pro Thr Lys Ile Leu Pro Cys Pro Arg Cys Asn Ser Met Glu Thr
    50                  55                  60

aag ttc tgt tac tac aac aac tac aac gta aac caa cct cgc cat ttt      240
Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln Pro Arg His Phe
65                  70                  75                  80

tgt aaa gct tgt cag aga tat tgg acc tca ggt ggg acc atg aga agt      288
Cys Lys Ala Cys Gln Arg Tyr Trp Thr Ser Gly Gly Thr Met Arg Ser
                85                  90                  95

gtt cca atc gga gca gga cgg cgc aag aac aag aac aac tca cca act      336
Val Pro Ile Gly Ala Gly Arg Arg Lys Asn Lys Asn Asn Ser Pro Thr
            100                 105                 110

tca cat tac cac cat gtg act atc tcc gaa aca aat ggt ccg gtc ctt      384
Ser His Tyr His His Val Thr Ile Ser Glu Thr Asn Gly Pro Val Leu
        115                 120                 125

agt ttc agc ctc gga gat gat caa aag gtc tcg agt aat agg ttt ggt      432
Ser Phe Ser Leu Gly Asp Asp Gln Lys Val Ser Ser Asn Arg Phe Gly
    130                 135                 140

aat caa aag cta gtt gct agg ata gag aac aat gac gag cgc tct aat      480
Asn Gln Lys Leu Val Ala Arg Ile Glu Asn Asn Asp Glu Arg Ser Asn
145                 150                 155                 160
```

aac aac act tcg aac ggt ttg aat tgt ttt ccg gga gtt tcg tgg ccg 528
Asn Asn Thr Ser Asn Gly Leu Asn Cys Phe Pro Gly Val Ser Trp Pro
165 170 175

tac acg tgg aat cct gcg ttt tac ccg gtt tac cct tat tgg agc atg 576
Tyr Thr Trp Asn Pro Ala Phe Tyr Pro Val Tyr Pro Tyr Trp Ser Met
180 185 190

cca gtg ttg tct tct ccg gta agt tca agt cct act tct act ctt ggt 624
Pro Val Leu Ser Ser Pro Val Ser Ser Ser Pro Thr Ser Thr Leu Gly
195 200 205

aag cat tcg aga gac gaa gac gag acg gtg aag caa aaa cag agg aat 672
Lys His Ser Arg Asp Glu Asp Glu Thr Val Lys Gln Lys Gln Arg Asn
210 215 220

gga tct gta ttg gtt cca aag act ttg aga att gat gat cct aat gaa 720
Gly Ser Val Leu Val Pro Lys Thr Leu Arg Ile Asp Asp Pro Asn Glu
225 230 235 240

gct gca aag agt tcg ata tgg aca aca ctt ggg atc aag aac gaa gtt 768
Ala Ala Lys Ser Ser Ile Trp Thr Thr Leu Gly Ile Lys Asn Glu Val
245 250 255

atg ttc aat ggg ttt ggt tcg aag aaa gag gtt aag ctc agt aac aaa 816
Met Phe Asn Gly Phe Gly Ser Lys Lys Glu Val Lys Leu Ser Asn Lys
260 265 270

gaa gaa aca gag acc tca ctt gtt ctt tgt gca aac cct gct gcg tta 864
Glu Glu Thr Glu Thr Ser Leu Val Leu Cys Ala Asn Pro Ala Ala Leu
275 280 285

tca aga tca atc aat ttc cat gag cag atg tga 897
Ser Arg Ser Ile Asn Phe His Glu Gln Met
290 295

<210> 276 <211> 298 <212> PRT <213> Arabidopsis thaliana <400> 276

Met Leu Glu Thr Lys Asp Pro Ala Ile Lys Leu Phe Gly Met Lys Ile
1 5 10 15

Pro Phe Pro Thr Val Leu Glu Val Ala Asp Glu Glu Glu Glu Lys Asn
20 25 30

Gln Asn Lys Thr Leu Thr Asp Gln Ser Glu Lys Asp Lys Thr Leu Lys
35 40 45

Lys Pro Thr Lys Ile Leu Pro Cys Pro Arg Cys Asn Ser Met Glu Thr
50 55 60

Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln Pro Arg His Phe

65 70 75 80

Cys Lys Ala Cys Gln Arg Tyr Trp Thr Ser Gly Gly Thr Met Arg Ser
85 90 95

Val Pro Ile Gly Ala Gly Arg Arg Lys Asn Lys Asn Asn Ser Pro Thr
100 105 110

Ser His Tyr His His Val Thr Ile Ser Glu Thr Asn Gly Pro Val Leu
115 120 125

Ser Phe Ser Leu Gly Asp Asp Gln Lys Val Ser Ser Asn Arg Phe Gly
130 135 140

Asn Gln Lys Leu Val Ala Arg Ile Glu Asn Asn Asp Glu Arg Ser Asn
145 150 155 160

Asn Asn Thr Ser Asn Gly Leu Asn Cys Phe Pro Gly Val Ser Trp Pro
165 170 175

Tyr Thr Trp Asn Pro Ala Phe Tyr Pro Val Tyr Pro Tyr Trp Ser Met
180 185 190

Pro Val Leu Ser Ser Pro Val Ser Ser Ser Pro Thr Ser Thr Leu Gly
195 200 205

Lys His Ser Arg Asp Glu Asp Glu Thr Val Lys Gln Lys Gln Arg Asn
210 215 220

Gly Ser Val Leu Val Pro Lys Thr Leu Arg Ile Asp Asp Pro Asn Glu
225 230 235 240

Ala Ala Lys Ser Ser Ile Trp Thr Thr Leu Gly Ile Lys Asn Glu Val
245 250 255

Met Phe Asn Gly Phe Gly Ser Lys Lys Glu Val Lys Leu Ser Asn Lys
260 265 270

Glu Glu Thr Glu Thr Ser Leu Val Leu Cys Ala Asn Pro Ala Ala Leu
275 280 285

Ser Arg Ser Ile Asn Phe His Glu Gln Met
290 295

<210> 277 <211> 1200 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1200) <223> G1903

<400> 277

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atg tct aaa tct aga gat acg gag ata aag ttg ttt ggg agg aca atc       48
Met Ser Lys Ser Arg Asp Thr Glu Ile Lys Leu Phe Gly Arg Thr Ile
1               5                   10                  15

aca tct ctt tta gat gtg aat tgt tat gat ccg tcg tcg ttg tcc cct       96
Thr Ser Leu Leu Asp Val Asn Cys Tyr Asp Pro Ser Ser Leu Ser Pro
            20                  25                  30

gtt cac gat gtt tct tct gat cca agc aag gag gat tcg tct tct tct      144
Val His Asp Val Ser Ser Asp Pro Ser Lys Glu Asp Ser Ser Ser Ser
        35                  40                  45

tca tct tct tgt tct cca act att gga cca atc agg gtt ccg gtt aaa      192
Ser Ser Ser Cys Ser Pro Thr Ile Gly Pro Ile Arg Val Pro Val Lys
    50                  55                  60

aaa agt gag caa gag agt aac aaa ttc aaa gat cca tat ata tta tcc      240
Lys Ser Glu Gln Glu Ser Asn Lys Phe Lys Asp Pro Tyr Ile Leu Ser
65                  70                  75                  80

gat cta aac gaa cca cca aaa gca gta tct gag att tca tca cca aga      288
Asp Leu Asn Glu Pro Pro Lys Ala Val Ser Glu Ile Ser Ser Pro Arg
                85                  90                  95

agt tcc aag aac aac tgt gat caa cag agc gag atc aca aca aca act      336
Ser Ser Lys Asn Asn Cys Asp Gln Gln Ser Glu Ile Thr Thr Thr Thr
            100                 105                 110

acc aca agt act aca tca gga gag aaa tca acg gct ctc aag aaa ccg      384
Thr Thr Ser Thr Thr Ser Gly Glu Lys Ser Thr Ala Leu Lys Lys Pro
        115                 120                 125

gac aag ctt att cca tgt cct aga tgt gaa agc gca aac acc aaa ttc      432
Asp Lys Leu Ile Pro Cys Pro Arg Cys Glu Ser Ala Asn Thr Lys Phe
    130                 135                 140

tgt tat tac aac aac tac aac gtg aac cag cca cgt tac ttc tgc agg      480
Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln Pro Arg Tyr Phe Cys Arg
145                 150                 155                 160

aac tgt cag agg tat tgg aca gct ggt gga tct atg agg aac gtt cct      528
Asn Cys Gln Arg Tyr Trp Thr Ala Gly Gly Ser Met Arg Asn Val Pro
                165                 170                 175

gtt ggc tca ggt cgt cgc aag aac aaa gga tgg cct tct tca aac cat      576
Val Gly Ser Gly Arg Arg Lys Asn Lys Gly Trp Pro Ser Ser Asn His
            180                 185                 190

tac ttg caa gtc act tct gag gat tgt gat aat aat aac tcg ggg acg      624
Tyr Leu Gln Val Thr Ser Glu Asp Cys Asp Asn Asn Asn Ser Gly Thr
        195                 200                 205
```

```
atc ctt agt ttc ggt tct tcg gag tct tcg gtt aca gag act ggt aag      672
Ile Leu Ser Phe Gly Ser Ser Glu Ser Ser Val Thr Glu Thr Gly Lys
    210                 215                 220

cat cag tca ggt gat aca gca aag ata agt gct gat tca gtt tct caa      720
His Gln Ser Gly Asp Thr Ala Lys Ile Ser Ala Asp Ser Val Ser Gln
225                 230                 235                 240

gaa aat aaa agc tac caa ggg ttt ctt cct ccg caa gta atg tta cct      768
Glu Asn Lys Ser Tyr Gln Gly Phe Leu Pro Pro Gln Val Met Leu Pro
                245                 250                 255

aat aat tct tct cct tgg cct tac caa tgg agt cca acg ggt cct aac      816
Asn Asn Ser Ser Pro Trp Pro Tyr Gln Trp Ser Pro Thr Gly Pro Asn
            260                 265                 270

gct agt ttc tac cct gtc ccc ttc tac tgg gga tgc acg gtt ccg ata      864
Ala Ser Phe Tyr Pro Val Pro Phe Tyr Trp Gly Cys Thr Val Pro Ile
        275                 280                 285

tac cct acc tca gag act tca tca tgt tta gga aaa cgg tca aga gat      912
Tyr Pro Thr Ser Glu Thr Ser Ser Cys Leu Gly Lys Arg Ser Arg Asp
    290                 295                 300

caa act gaa gga aga atc aat gat act aat aca aca ata act act aca      960
Gln Thr Glu Gly Arg Ile Asn Asp Thr Asn Thr Thr Ile Thr Thr Thr
305                 310                 315                 320

aga gca aga ttg gtc tca gaa tct ctt aga atg aat atc gaa gct agt     1008
Arg Ala Arg Leu Val Ser Glu Ser Leu Arg Met Asn Ile Glu Ala Ser
                325                 330                 335

aag agc gct gtg tgg tct aag tta ccg aca aaa ccc gag aaa aaa acg     1056
Lys Ser Ala Val Trp Ser Lys Leu Pro Thr Lys Pro Glu Lys Lys Thr
            340                 345                 350

caa gga ttc agt ttg ttc aat gga ttt gac aca aag gga aac agc aac     1104
Gln Gly Phe Ser Leu Phe Asn Gly Phe Asp Thr Lys Gly Asn Ser Asn
        355                 360                 365

aga agt agc ttg gtc tcc gaa act tct cac agt cta caa gca aac cct     1152
Arg Ser Ser Leu Val Ser Glu Thr Ser His Ser Leu Gln Ala Asn Pro
    370                 375                 380

gca gcg atg tct aga gct atg aac ttc agg gag agc atg caa caa taa     1200
Ala Ala Met Ser Arg Ala Met Asn Phe Arg Glu Ser Met Gln Gln
385                 390                 395
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<210> 278 <211> 399 <212> PRT <213> Arabidopsis thaliana <400> 278

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Met Ser Lys Ser Arg Asp Thr Glu Ile Lys Leu Phe Gly Arg Thr Ile
1               5                   10                  15

Thr Ser Leu Leu Asp Val Asn Cys Tyr Asp Pro Ser Ser Leu Ser Pro
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20 25 30

Val His Asp Val Ser Ser Asp Pro Ser Lys Glu Asp Ser Ser Ser Ser
35 40 45

Ser Ser Ser Cys Ser Pro Thr Ile Gly Pro Ile Arg Val Pro Val Lys
50 55 60

Lys Ser Glu Gln Glu Ser Asn Lys Phe Lys Asp Pro Tyr Ile Leu Ser
65 70 75 80

Asp Leu Asn Glu Pro Pro Lys Ala Val Ser Glu Ile Ser Ser Pro Arg
85 90 95

Ser Ser Lys Asn Asn Cys Asp Gln Gln Ser Glu Ile Thr Thr Thr Thr
100 105 110

Thr Thr Ser Thr Thr Ser Gly Glu Lys Ser Thr Ala Leu Lys Lys Pro
115 120 125

Asp Lys Leu Ile Pro Cys Pro Arg Cys Glu Ser Ala Asn Thr Lys Phe
130 135 140

Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln Pro Arg Tyr Phe Cys Arg
145 150 155 160

Asn Cys Gln Arg Tyr Trp Thr Ala Gly Gly Ser Met Arg Asn Val Pro
165 170 175

Val Gly Ser Gly Arg Arg Lys Asn Lys Gly Trp Pro Ser Ser Asn His
180 185 190

Tyr Leu Gln Val Thr Ser Glu Asp Cys Asp Asn Asn Asn Ser Gly Thr
195 200 205

Ile Leu Ser Phe Gly Ser Ser Glu Ser Ser Val Thr Glu Thr Gly Lys
210 215 220

His Gln Ser Gly Asp Thr Ala Lys Ile Ser Ala Asp Ser Val Ser Gln
225 230 235 240

Glu Asn Lys Ser Tyr Gln Gly Phe Leu Pro Pro Gln Val Met Leu Pro
245 250 255

Asn Asn Ser Ser Pro Trp Pro Tyr Gln Trp Ser Pro Thr Gly Pro Asn
260 265 270

Ala Ser Phe Tyr Pro Val Pro Phe Tyr Trp Gly Cys Thr Val Pro Ile
275 280 285

Tyr Pro Thr Ser Glu Thr Ser Ser Cys Leu Gly Lys Arg Ser Arg Asp
290 295 300

Gln Thr Glu Gly Arg Ile Asn Asp Thr Asn Thr Thr Ile Thr Thr Thr
305 310 315 320

Arg Ala Arg Leu Val Ser Glu Ser Leu Arg Met Asn Ile Glu Ala Ser
325 330 335

Lys Ser Ala Val Trp Ser Lys Leu Pro Thr Lys Pro Glu Lys Lys Thr
340 345 350

Gln Gly Phe Ser Leu Phe Asn Gly Phe Asp Thr Lys Gly Asn Ser Asn
355 360 365

Arg Ser Ser Leu Val Ser Glu Thr Ser His Ser Leu Gln Ala Asn Pro
370 375 380

Ala Ala Met Ser Arg Ala Met Asn Phe Arg Glu Ser Met Gln Gln
385 390 395

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<222> (42)..(764) <223> G1950

<400> 279
ctgaattcga actttggaag aagaagaagc tttgatcaat c atg gaa att gca acc 56
Met Glu Ile Ala Thr
1 5

gat aca gca aag cag atg aga gac gaa gag ttg ttc aaa gca gcg gaa 104
Asp Thr Ala Lys Gln Met Arg Asp Glu Glu Leu Phe Lys Ala Ala Glu
10 15 20

tgg gga gat tca tcg ttg ttc atg tca tta tct gaa gaa cag ctc tct 152
Trp Gly Asp Ser Ser Leu Phe Met Ser Leu Ser Glu Glu Gln Leu Ser
25 30 35

aaa tct ctc aat ttc aga aac gaa gat ggt cgc tct ctc ctc cat gtc 200
Lys Ser Leu Asn Phe Arg Asn Glu Asp Gly Arg Ser Leu Leu His Val
40 45 50

gct gct tcc ttc ggc cat tct caa ata gtg aag ttg tta tca agt tca 248
Ala Ala Ser Phe Gly His Ser Gln Ile Val Lys Leu Leu Ser Ser Ser
55 60 65

gat gaa gca aag act gta atc aat agc aag gat gat gaa gga tgg gct 296
Asp Glu Ala Lys Thr Val Ile Asn Ser Lys Asp Asp Glu Gly Trp Ala
70 75 80 85

cct ttg cat tcc gct gct agc atc ggt aat gct gag ctc gtt gag gtg 344
Pro Leu His Ser Ala Ala Ser Ile Gly Asn Ala Glu Leu Val Glu Val
90 95 100

ctt ttg acc aga ggt gct gat gtc aat gcc aaa aat aac ggt ggt cgc 392
Leu Leu Thr Arg Gly Ala Asp Val Asn Ala Lys Asn Asn Gly Gly Arg
105 110 115

act gct ctt cac tat gct gct agc aaa ggc cgg ttg gag att gct cag 440
Thr Ala Leu His Tyr Ala Ala Ser Lys Gly Arg Leu Glu Ile Ala Gln
120 125 130

ctt tta tta aca cac ggt gca aag att aac atc aca gac aag gtt ggt 488
Leu Leu Leu Thr His Gly Ala Lys Ile Asn Ile Thr Asp Lys Val Gly
135 140 145

tgc act ccg ctt cac agg gca gca agc gtg gga aag tta gaa gtt tgt 536
Cys Thr Pro Leu His Arg Ala Ala Ser Val Gly Lys Leu Glu Val Cys
150 155 160 165

gaa ttt ctt att gaa gaa gga gca gag atc gat gct acg gat aaa atg 584
Glu Phe Leu Ile Glu Glu Gly Ala Glu Ile Asp Ala Thr Asp Lys Met
170 175 180

ggt caa act gca ctc atg cat tca gtt atc tgc gat gac aaa cag gtt 632
Gly Gln Thr Ala Leu Met His Ser Val Ile Cys Asp Asp Lys Gln Val
185 190 195

gcg ttc ctg ctt ata aga cat ggt gca gat gtg gat gta gaa gac aag 680
Ala Phe Leu Leu Ile Arg His Gly Ala Asp Val Asp Val Glu Asp Lys
200 205 210

gaa ggc tac act gtt cta ggc cga gct acc aat gaa ttc cga cct gca 728
Glu Gly Tyr Thr Val Leu Gly Arg Ala Thr Asn Glu Phe Arg Pro Ala
215 220 225

ctt atc gat gct gct aag gcc atg ctt gaa gga taa aatgactctg 774
Leu Ile Asp Ala Ala Lys Ala Met Leu Glu Gly
230 235 240

gattacttta aaacttacta actctgagag ttgtttagtt acttaaaagg atttttcttt 834

actgtatcat gtttgcaaaa tgtttctgcc ttatcaattc atgttctgt 883

<210> 280 <211> 240 <212> PRT <213> Arabidopsis thaliana <400> 280

Met Glu Ile Ala Thr Asp Thr Ala Lys Gln Met Arg Asp Glu Glu Leu

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1               5                   10                  15

Phe Lys Ala Ala Glu Trp Gly Asp Ser Ser Leu Phe Met Ser Leu Ser
            20                  25                  30

Glu Glu Gln Leu Ser Lys Ser Leu Asn Phe Arg Asn Glu Asp Gly Arg
        35                  40                  45

Ser Leu Leu His Val Ala Ala Ser Phe Gly His Ser Gln Ile Val Lys
    50                  55                  60

Leu Leu Ser Ser Ser Asp Glu Ala Lys Thr Val Ile Asn Ser Lys Asp
65                  70                  75                  80

Asp Glu Gly Trp Ala Pro Leu His Ser Ala Ala Ser Ile Gly Asn Ala
                85                  90                  95

Glu Leu Val Glu Val Leu Leu Thr Arg Gly Ala Asp Val Asn Ala Lys
            100                 105                 110

Asn Asn Gly Gly Arg Thr Ala Leu His Tyr Ala Ala Ser Lys Gly Arg
        115                 120                 125

Leu Glu Ile Ala Gln Leu Leu Leu Thr His Gly Ala Lys Ile Asn Ile
    130                 135                 140

Thr Asp Lys Val Gly Cys Thr Pro Leu His Arg Ala Ala Ser Val Gly
145                 150                 155                 160

Lys Leu Glu Val Cys Glu Phe Leu Ile Glu Glu Gly Ala Glu Ile Asp
                165                 170                 175

Ala Thr Asp Lys Met Gly Gln Thr Ala Leu Met His Ser Val Ile Cys
            180                 185                 190

Asp Asp Lys Gln Val Ala Phe Leu Leu Ile Arg His Gly Ala Asp Val
        195                 200                 205

Asp Val Glu Asp Lys Glu Gly Tyr Thr Val Leu Gly Arg Ala Thr Asn
    210                 215                 220

Glu Phe Arg Pro Ala Leu Ile Asp Ala Ala Lys Ala Met Leu Glu Gly
225                 230                 235                 240
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tcgtcttcct tggtcctgga ttgcttcatg aatttctagg acaaca atg gag gct 115
Met Glu Ala
1

cgt cca gtt cat aga tca ggt tcg aga gac ctc aca cgc act tct tca 163
Arg Pro Val His Arg Ser Gly Ser Arg Asp Leu Thr Arg Thr Ser Ser
5 10 15

atc cca tct aca caa aaa cct tca cca gta gaa gat agt ttc atg aga 211
Ile Pro Ser Thr Gln Lys Pro Ser Pro Val Glu Asp Ser Phe Met Arg
20 25 30 35

tca gat aac aac agt cag tta atg tct aga cca tta gga caa acc tac 259
Ser Asp Asn Asn Ser Gln Leu Met Ser Arg Pro Leu Gly Gln Thr Tyr
40 45 50

cat tta ctt tca tct agt aac ggt gga gct gtt gga cat ata tgt tct 307
His Leu Leu Ser Ser Ser Asn Gly Gly Ala Val Gly His Ile Cys Ser
55 60 65

tct tca tca tct ggt ttt gca acc aat ctc cat tac tca act atg gta 355
Ser Ser Ser Ser Gly Phe Ala Thr Asn Leu His Tyr Ser Thr Met Val
70 75 80

tct cat gag aaa caa caa cac tac aca gga agc agc agt aat aat gct 403
Ser His Glu Lys Gln Gln His Tyr Thr Gly Ser Ser Ser Asn Asn Ala
85 90 95

gtg cag aca cca agc aac aac gat agt gct tgg tgt cat gat tca ttg 451
Val Gln Thr Pro Ser Asn Asn Asp Ser Ala Trp Cys His Asp Ser Leu
100 105 110 115

cca gga ggg ttt ctt gac ttc cat gaa acc aac ccg gcg att caa aac 499
Pro Gly Gly Phe Leu Asp Phe His Glu Thr Asn Pro Ala Ile Gln Asn
120 125 130

aac tgt cag att gag gat ggt ggc att gcg gct gct ttt gat gac att 547
Asn Cys Gln Ile Glu Asp Gly Gly Ile Ala Ala Ala Phe Asp Asp Ile
135 140 145

caa aaa cga agt gat tgg cat gaa tgg gct gac cat ttg atc act gat 595
Gln Lys Arg Ser Asp Trp His Glu Trp Ala Asp His Leu Ile Thr Asp
150 155 160

gat gat cct ttg atg tct act aac tgg aat gat ctc ttg ctt gaa aca 643
Asp Asp Pro Leu Met Ser Thr Asn Trp Asn Asp Leu Leu Leu Glu Thr
165 170 175

aat tcc aat tca gat tca aag gac cag aag aca ctg caa att ccg caa 691

```
Asn Ser Asn Ser Asp Ser Lys Asp Gln Lys Thr Leu Gln Ile Pro Gln
180                 185                 190                 195

cct cag att gtt cag cag caa cct tct ccg tct gtg gaa ttg cga cct      739
Pro Gln Ile Val Gln Gln Gln Pro Ser Pro Ser Val Glu Leu Arg Pro
                200                 205                 210

gtt agc aca aca tct tca aac agc aat aac gga acg ggc aag gca cga      787
Val Ser Thr Thr Ser Ser Asn Ser Asn Asn Gly Thr Gly Lys Ala Arg
            215                 220                 225

atg cgt tgg acg cca gag ctt cac gag gct ttt gtt gag gct gtc aac      835
Met Arg Trp Thr Pro Glu Leu His Glu Ala Phe Val Glu Ala Val Asn
        230                 235                 240

agt ctt ggc ggt agt gaa aga gct act cct aaa ggg gta ctg aag att      883
Ser Leu Gly Gly Ser Glu Arg Ala Thr Pro Lys Gly Val Leu Lys Ile
    245                 250                 255

atg aaa gtt gaa ggc ttg act ata tat cat gtt aaa agc cat tta cag      931
Met Lys Val Glu Gly Leu Thr Ile Tyr His Val Lys Ser His Leu Gln
260                 265                 270                 275

aaa tat agg aca gct aga tat cgg cca gaa cca tca gaa act ggt tcg      979
Lys Tyr Arg Thr Ala Arg Tyr Arg Pro Glu Pro Ser Glu Thr Gly Ser
                280                 285                 290

cca gaa agg aag ttg aca ccg ctt gaa cat ata aca tct ctt gat ttg     1027
Pro Glu Arg Lys Leu Thr Pro Leu Glu His Ile Thr Ser Leu Asp Leu
            295                 300                 305

aaa ggt ggg ata ggt att aca gag gct cta cga ctt cag atg gaa gta     1075
Lys Gly Gly Ile Gly Ile Thr Glu Ala Leu Arg Leu Gln Met Glu Val
        310                 315                 320

cag aag caa ctc cat gag cag ctc gag att caa aga aac ctg caa ctc     1123
Gln Lys Gln Leu His Glu Gln Leu Glu Ile Gln Arg Asn Leu Gln Leu
    325                 330                 335

cga ata gaa gaa caa ggc aag tac ctg caa atg atg ttc gag aag caa     1171
Arg Ile Glu Glu Gln Gly Lys Tyr Leu Gln Met Met Phe Glu Lys Gln
340                 345                 350                 355

aac tct ggt ctt acc aaa ggg aca gcc tca aca tca gat tcc gca gcc     1219
Asn Ser Gly Leu Thr Lys Gly Thr Ala Ser Thr Ser Asp Ser Ala Ala
                360                 365                 370

aaa tct gaa caa gaa gac aag aag act gct gat tcg aag gag gtt cca     1267
Lys Ser Glu Gln Glu Asp Lys Lys Thr Ala Asp Ser Lys Glu Val Pro
            375                 380                 385

gaa gaa gaa acc agg aaa tgt gag gaa cta gaa tct cca cag cca aag     1315
Glu Glu Glu Thr Arg Lys Cys Glu Glu Leu Glu Ser Pro Gln Pro Lys
        390                 395                 400

cgt ccc aaa atc gat aat tga aagtattggt cttttgctgg ataatctcgg       1366
Arg Pro Lys Ile Asp Asn
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405

agtttcagag ttaacagtga tagagagaac gagctcttat cttgaggttc ttcaggactt 1426

ctctcgcggc cgctctag 1444

<210> 282 <211> 409 <212> PRT <213> Arabidopsis thaliana <400> 282

Met Glu Ala Arg Pro Val His Arg Ser Gly Ser Arg Asp Leu Thr Arg
1 5 10 15

Thr Ser Ser Ile Pro Ser Thr Gln Lys Pro Ser Pro Val Glu Asp Ser
20 25 30

Phe Met Arg Ser Asp Asn Asn Ser Gln Leu Met Ser Arg Pro Leu Gly
35 40 45

Gln Thr Tyr His Leu Leu Ser Ser Ser Asn Gly Gly Ala Val Gly His
50 55 60

Ile Cys Ser Ser Ser Ser Ser Gly Phe Ala Thr Asn Leu His Tyr Ser
65 70 75 80

Thr Met Val Ser His Glu Lys Gln Gln His Tyr Thr Gly Ser Ser Ser
85 90 95

Asn Asn Ala Val Gln Thr Pro Ser Asn Asn Asp Ser Ala Trp Cys His
100 105 110

Asp Ser Leu Pro Gly Gly Phe Leu Asp Phe His Glu Thr Asn Pro Ala
115 120 125

Ile Gln Asn Asn Cys Gln Ile Glu Asp Gly Gly Ile Ala Ala Ala Phe
130 135 140

Asp Asp Ile Gln Lys Arg Ser Asp Trp His Glu Trp Ala Asp His Leu
145 150 155 160

Ile Thr Asp Asp Asp Pro Leu Met Ser Thr Asn Trp Asn Asp Leu Leu
165 170 175

Leu Glu Thr Asn Ser Asn Ser Asp Ser Lys Asp Gln Lys Thr Leu Gln
180 185 190

Ile Pro Gln Pro Gln Ile Val Gln Gln Gln Pro Ser Pro Ser Val Glu
195 200 205

Leu Arg Pro Val Ser Thr Thr Ser Ser Asn Ser Asn Asn Gly Thr Gly
210 215 220

Lys Ala Arg Met Arg Trp Thr Pro Glu Leu His Glu Ala Phe Val Glu
225 230 235 240

Ala Val Asn Ser Leu Gly Gly Ser Glu Arg Ala Thr Pro Lys Gly Val
245 250 255

Leu Lys Ile Met Lys Val Glu Gly Leu Thr Ile Tyr His Val Lys Ser
260 265 270

His Leu Gln Lys Tyr Arg Thr Ala Arg Tyr Arg Pro Glu Pro Ser Glu
275 280 285

Thr Gly Ser Pro Glu Arg Lys Leu Thr Pro Leu Glu His Ile Thr Ser
290 295 300

Leu Asp Leu Lys Gly Gly Ile Gly Ile Thr Glu Ala Leu Arg Leu Gln
305 310 315 320

Met Glu Val Gln Lys Gln Leu His Glu Gln Leu Glu Ile Gln Arg Asn
325 330 335

Leu Gln Leu Arg Ile Glu Glu Gln Gly Lys Tyr Leu Gln Met Met Phe
340 345 350

Glu Lys Gln Asn Ser Gly Leu Thr Lys Gly Thr Ala Ser Thr Ser Asp
355 360 365

Ser Ala Ala Lys Ser Glu Gln Glu Asp Lys Lys Thr Ala Asp Ser Lys
370 375 380

Glu Val Pro Glu Glu Glu Thr Arg Lys Cys Glu Glu Leu Glu Ser Pro
385 390 395 400

Gln Pro Lys Arg Pro Lys Ile Asp Asn
405

Replacement Sheet

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tatataaaga tctcgagaat agcatt atg aat atc gtc tct tgg aaa gat gca 113
Met Asn Ile Val Ser Trp Lys Asp Ala
1 5

aac gac gaa gtt gca ggc ggc gct acg aca aga cgt gaa aga gaa gta 161
Asn Asp Glu Val Ala Gly Gly Ala Thr Thr Arg Arg Glu Arg Glu Val
10 15 20 25

aaa gag gat caa gaa gaa acc gaa gtc aga gcc acc agt ggc aaa acc 209
Lys Glu Asp Gln Glu Glu Thr Glu Val Arg Ala Thr Ser Gly Lys Thr
30 35 40

gta att aaa aag cag cct aca tcg atc tct tct tct tct tct tcg tgg 257
Val Ile Lys Lys Gln Pro Thr Ser Ile Ser Ser Ser Ser Ser Ser Trp
45 50 55

atg aaa tcc aag gat ccg agg att gtt agg gtt tca cgc gcc ttt gga 305
Met Lys Ser Lys Asp Pro Arg Ile Val Arg Val Ser Arg Ala Phe Gly
60 65 70

ggc aaa gac cgt cac agc aaa gtg tgt acg tta cgt gga cta cgt gac 353
Gly Lys Asp Arg His Ser Lys Val Cys Thr Leu Arg Gly Leu Arg Asp
75 80 85

aga cgc gtg aga tta tca gtc cca acg gct att cag ctc tac gat ctt 401
Arg Arg Val Arg Leu Ser Val Pro Thr Ala Ile Gln Leu Tyr Asp Leu
90 95 100 105

caa gaa cgg ctc ggt gtt gac cag cct agc aaa gcc gtt gac tgg ttg 449
Gln Glu Arg Leu Gly Val Asp Gln Pro Ser Lys Ala Val Asp Trp Leu
110 115 120

ctt gat gca gct aaa gag gag atc gac gag cta cct ccg tta cct atc 497
Leu Asp Ala Ala Lys Glu Glu Ile Asp Glu Leu Pro Pro Leu Pro Ile
125 130 135

tcg ccg gaa aat ttc agc atc ttc aac cat cat cag tcc ttc ttg aat 545
Ser Pro Glu Asn Phe Ser Ile Phe Asn His His Gln Ser Phe Leu Asn
140 145 150

ctt ggt caa cgg ccc ggt caa gat ccg acc caa ctc ggg ttt aaa atc 593
Leu Gly Gln Arg Pro Gly Gln Asp Pro Thr Gln Leu Gly Phe Lys Ile
155 160 165

aat gga tgt gta caa aag tct act act act agc cgc gaa gaa aac gat 641
Asn Gly Cys Val Gln Lys Ser Thr Thr Thr Ser Arg Glu Glu Asn Asp
170 175 180 185

aga gag aaa gga gaa aac gat gtc gtt tac aca aac aat cat cat gtt 689
Arg Glu Lys Gly Glu Asn Asp Val Val Tyr Thr Asn Asn His His Val
190 195 200

ggg tct tat gga act tat cac aac ctg gaa cat cat cat cat cat cac 737
Gly Ser Tyr Gly Thr Tyr His Asn Leu Glu His His His His His His
205 210 215

caa cat ttg agt tta cag gca gat tat cat agt cat caa cta cat agt 785
Gln His Leu Ser Leu Gln Ala Asp Tyr His Ser His Gln Leu His Ser
220 225 230

ctt gtc cca ttt cca tca caa att ttg gta tgt cca atg acg aca tca 833
Leu Val Pro Phe Pro Ser Gln Ile Leu Val Cys Pro Met Thr Thr Ser
235 240 245

cca aca act aca act ata caa tct ttg ttt cca tca tca tcg tca gct 881
Pro Thr Thr Thr Thr Ile Gln Ser Leu Phe Pro Ser Ser Ser Ser Ala
250 255 260 265

ggt tca ggg act atg gag aca tta gat ccg agg caa atg tag 923
Gly Ser Gly Thr Met Glu Thr Leu Asp Pro Arg Gln Met
270 275

caacaatggt ggtagagaca ttgataatcg gatgtcgtcg gtccaattca accgaactaa 983

tagcactaca acggctaaca tgtcgaggca tctaggctcg gagcgttgta caagtagagg 1043

aagtgatcac catatgtgaa gttagattat tgaaacgata taattgttgt ttgatgtgtt 1103

cagaaataag gggacac 1120

<210> 284 <211> 278 <212> PRT <213> Arabidopsis thaliana <400> 284

Met Asn Ile Val Ser Trp Lys Asp Ala Asn Asp Glu Val Ala Gly Gly
1 5 10 15

Ala Thr Thr Arg Arg Glu Arg Glu Val Lys Glu Asp Gln Glu Glu Thr
20 25 30

Glu Val Arg Ala Thr Ser Gly Lys Thr Val Ile Lys Lys Gln Pro Thr
35 40 45

Ser Ile Ser Ser Ser Ser Ser Ser Trp Met Lys Ser Lys Asp Pro Arg
50 55 60

Ile Val Arg Val Ser Arg Ala Phe Gly Gly Lys Asp Arg His Ser Lys
65 70 75 80

Val Cys Thr Leu Arg Gly Leu Arg Asp Arg Arg Val Arg Leu Ser Val
85 90 95

Pro Thr Ala Ile Gln Leu Tyr Asp Leu Gln Glu Arg Leu Gly Val Asp

100 105 110

Gln Pro Ser Lys Ala Val Asp Trp Leu Leu Asp Ala Ala Lys Glu Glu
115 120 125

Ile Asp Glu Leu Pro Pro Leu Pro Ile Ser Pro Glu Asn Phe Ser Ile
130 135 140

Phe Asn His His Gln Ser Phe Leu Asn Leu Gly Gln Arg Pro Gly Gln
145 150 155 160

Asp Pro Thr Gln Leu Gly Phe Lys Ile Asn Gly Cys Val Gln Lys Ser
165 170 175

Thr Thr Thr Ser Arg Glu Glu Asn Asp Arg Glu Lys Gly Glu Asn Asp
180 185 190

Val Val Tyr Thr Asn Asn His His Val Gly Ser Tyr Gly Thr Tyr His
195 200 205

Asn Leu Glu His His His His His His Gln His Leu Ser Leu Gln Ala
210 215 220

Asp Tyr His Ser His Gln Leu His Ser Leu Val Pro Phe Pro Ser Gln
225 230 235 240

Ile Leu Val Cys Pro Met Thr Thr Ser Pro Thr Thr Thr Thr Ile Gln
245 250 255

Ser Leu Phe Pro Ser Ser Ser Ser Ala Gly Ser Gly Thr Met Glu Thr
260 265 270

Leu Asp Pro Arg Gln Met
275

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<222> (89)..(784) <223> G2143

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aaccctataa attccacaaa aaaggagg atg gat aac tcc gac att cta atg 112
Met Asp Asn Ser Asp Ile Leu Met
1 5

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aac atg atg atg cag cag atg gag aag ctt cct gaa cac ttc tct aac      160
Asn Met Met Met Gln Gln Met Glu Lys Leu Pro Glu His Phe Ser Asn
    10                  15                  20

tca aac cct aac cct aat ccc cat aac att atg atg ctt tct gaa tcc      208
Ser Asn Pro Asn Pro Asn Pro His Asn Ile Met Met Leu Ser Glu Ser
25                  30                  35                  40

aac acc cac ccg ttc ttc ttc aac ccc act cat tct cat ctc cca ttt      256
Asn Thr His Pro Phe Phe Phe Asn Pro Thr His Ser His Leu Pro Phe
                45                  50                  55

gac caa acc atg cct cac cac caa ccc ggt tta aat ttc cgg tac gcc      304
Asp Gln Thr Met Pro His His Gln Pro Gly Leu Asn Phe Arg Tyr Ala
            60                  65                  70

ccc tcc ccg tca tca tct ctc ccg gag aag aga gga ggc tgc agc gac      352
Pro Ser Pro Ser Ser Ser Leu Pro Glu Lys Arg Gly Gly Cys Ser Asp
        75                  80                  85

aac gcc aac atg gcg gcg atg aga gag atg atc ttt cga ata gcc gtg      400
Asn Ala Asn Met Ala Ala Met Arg Glu Met Ile Phe Arg Ile Ala Val
    90                  95                  100

atg cag cct ata cat att gat ccg gaa tcc gta aag cca cca aag aga      448
Met Gln Pro Ile His Ile Asp Pro Glu Ser Val Lys Pro Pro Lys Arg
105                 110                 115                 120

aag aac gtg agg atc tct aag gat cca cag agc gtg gca gct cgg cat      496
Lys Asn Val Arg Ile Ser Lys Asp Pro Gln Ser Val Ala Ala Arg His
                125                 130                 135

cga agg gag agg ata agc gag cgg att cgg att ctt cag cgg ctt gtt      544
Arg Arg Glu Arg Ile Ser Glu Arg Ile Arg Ile Leu Gln Arg Leu Val
            140                 145                 150

ccc ggt ggg act aag atg gat acg gcg tcg atg ctc gat gag gct atc      592
Pro Gly Gly Thr Lys Met Asp Thr Ala Ser Met Leu Asp Glu Ala Ile
        155                 160                 165

cat tac gtt aag ttt ctc aag aag caa gtg cag tcg ctg gag gaa cat      640
His Tyr Val Lys Phe Leu Lys Lys Gln Val Gln Ser Leu Glu Glu His
    170                 175                 180

gcg gtg gtt aac ggc gga gga atg acg gcg gtg gcc gga gga gca ctt      688
Ala Val Val Asn Gly Gly Gly Met Thr Ala Val Ala Gly Gly Ala Leu
185                 190                 195                 200

gcg ggt act gtt ggt gga gga tat gga gga aaa ggg tgt ggc att atg      736
Ala Gly Thr Val Gly Gly Gly Tyr Gly Gly Lys Gly Cys Gly Ile Met
                205                 210                 215

cgg tct gat cat cac cag atg ctt gga aat gca cag att ctt aga tga      784
Arg Ser Asp His His Gln Met Leu Gly Asn Ala Gln Ile Leu Arg
            220                 225                 230

tgatgatgtt gatttttaaa tatatatcat atgtttatta atatgacggg aaaaaatatt    844
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atcgagggag ttgaatttag tatcatgaaa ctatgagagc atttttttta aatgttttta 904

tctttccggg tttcgataat gtttgggatg gttaattaac aatttaaaag tcagacaact 964

tggttgtaaa gactaaagaa taagcatagt ttatcaattt atcattacta aatgaaatag 1024

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Met Asp Asn Ser Asp Ile Leu Met Asn Met Met Met Gln Gln Met Glu
1 5 10 15

Lys Leu Pro Glu His Phe Ser Asn Ser Asn Pro Asn Pro Asn Pro His
20 25 30

Asn Ile Met Met Leu Ser Glu Ser Asn Thr His Pro Phe Phe Phe Asn
35 40 45

Pro Thr His Ser His Leu Pro Phe Asp Gln Thr Met Pro His His Gln
50 55 60

Pro Gly Leu Asn Phe Arg Tyr Ala Pro Ser Pro Ser Ser Ser Leu Pro
65 70 75 80

Glu Lys Arg Gly Gly Cys Ser Asp Asn Ala Asn Met Ala Ala Met Arg
85 90 95

Glu Met Ile Phe Arg Ile Ala Val Met Gln Pro Ile His Ile Asp Pro
100 105 110

Glu Ser Val Lys Pro Pro Lys Arg Lys Asn Val Arg Ile Ser Lys Asp
115 120 125

Pro Gln Ser Val Ala Ala Arg His Arg Arg Glu Arg Ile Ser Glu Arg
130 135 140

Ile Arg Ile Leu Gln Arg Leu Val Pro Gly Gly Thr Lys Met Asp Thr
145 150 155 160

Ala Ser Met Leu Asp Glu Ala Ile His Tyr Val Lys Phe Leu Lys Lys
165 170 175

Gln Val Gln Ser Leu Glu Glu His Ala Val Val Asn Gly Gly Gly Met
180 185 190

Thr Ala Val Ala Gly Gly Ala Leu Ala Gly Thr Val Gly Gly Gly Tyr
195 200 205

Gly Gly Lys Gly Cys Gly Ile Met Arg Ser Asp His His Gln Met Leu
210 215 220

Gly Asn Ala Gln Ile Leu Arg
225 230

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<222> (143)..(934) <223> G2509

<400> 287
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cctcaattcc aaatcttaaa ccctaaattt acagacacaa tcgagatcac ctgaaaaaag 120

aggtttaaag attttagcaa ag atg gcg aat tca gga aat tat gga aag agg 172
Met Ala Asn Ser Gly Asn Tyr Gly Lys Arg
1 5 10

ccc ttt cga ggc gat gaa tcg gat gaa aag aaa gaa gcc gat gat gat 220
Pro Phe Arg Gly Asp Glu Ser Asp Glu Lys Lys Glu Ala Asp Asp Asp
15 20 25

gag aac ata ttc cct ttc ttc tct gcc cga tcc caa tat gac atg cgt 268
Glu Asn Ile Phe Pro Phe Phe Ser Ala Arg Ser Gln Tyr Asp Met Arg
30 35 40

gcc atg gtc tca gcc ttg act caa gtc att gga aac caa agc agc tct 316
Ala Met Val Ser Ala Leu Thr Gln Val Ile Gly Asn Gln Ser Ser Ser
45 50 55

cat gat aat aac caa cat caa cct gtt gtg tat aat caa caa gat cct 364
His Asp Asn Asn Gln His Gln Pro Val Val Tyr Asn Gln Gln Asp Pro
60 65 70

aac cca ccg gct cct cca act caa gat caa ggg cta ttg agg aag agg 412
Asn Pro Pro Ala Pro Pro Thr Gln Asp Gln Gly Leu Leu Arg Lys Arg
75 80 85 90

cac tat aga ggg gta aga caa cga cca tgg gga aag tgg gca gct gaa 460
His Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Trp Ala Ala Glu
95 100 105

att cgg gat ccg caa aag gca gca cgg gtg tgg ctc ggg aca ttt gag 508
Ile Arg Asp Pro Gln Lys Ala Ala Arg Val Trp Leu Gly Thr Phe Glu
110 115 120

act gct gaa gct gcg gct tta gct tat gat aac gca gct ctt aag ttc 556
Thr Ala Glu Ala Ala Ala Leu Ala Tyr Asp Asn Ala Ala Leu Lys Phe
125 130 135

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aaa gga agc aaa gcc aaa ctc aat ttc cct gag aga gct caa cta gca      604
Lys Gly Ser Lys Ala Lys Leu Asn Phe Pro Glu Arg Ala Gln Leu Ala
    140                 145                 150

agt aac act agt aca act acc ggt cca cca aac tat tat tct tct aat      652
Ser Asn Thr Ser Thr Thr Thr Gly Pro Pro Asn Tyr Tyr Ser Ser Asn
155                 160                 165                 170

aat caa att tac tac tca aat ccg cag act aat ccg caa acc ata cct      700
Asn Gln Ile Tyr Tyr Ser Asn Pro Gln Thr Asn Pro Gln Thr Ile Pro
                175                 180                 185

tat ttt aac caa tac tac tat aac caa tat ctt cat caa ggg ggg aat      748
Tyr Phe Asn Gln Tyr Tyr Tyr Asn Gln Tyr Leu His Gln Gly Gly Asn
            190                 195                 200

agt aac gat gca tta agt tat agc ttg gcc ggt gga gaa acc gga ggc      796
Ser Asn Asp Ala Leu Ser Tyr Ser Leu Ala Gly Gly Glu Thr Gly Gly
        205                 210                 215

tca atg tat aat cat cag acg tta tct act aca aat tct tca tct tct      844
Ser Met Tyr Asn His Gln Thr Leu Ser Thr Thr Asn Ser Ser Ser Ser
    220                 225                 230

ggt gga tct tca agg caa caa gat gat gaa caa gat tac gcc aga tat      892
Gly Gly Ser Ser Arg Gln Gln Asp Asp Glu Gln Asp Tyr Ala Arg Tyr
235                 240                 245                 250

ttg cgt ttt ggg gat tct tca cct cct aat tct ggt ttt tga              934
Leu Arg Phe Gly Asp Ser Ser Pro Pro Asn Ser Gly Phe
                255                 260

gatcttcaat aaactgataa taaaggattt gggtcacttg ttatgagggg atcatatgtt    994

ttctaa                                                              1000
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Met Ala Asn Ser Gly Asn Tyr Gly Lys Arg Pro Phe Arg Gly Asp Glu
1               5                   10                  15

Ser Asp Glu Lys Lys Glu Ala Asp Asp Asp Glu Asn Ile Phe Pro Phe
            20                  25                  30

Phe Ser Ala Arg Ser Gln Tyr Asp Met Arg Ala Met Val Ser Ala Leu
        35                  40                  45

Thr Gln Val Ile Gly Asn Gln Ser Ser Ser His Asp Asn Asn Gln His
    50                  55                  60

Gln Pro Val Val Tyr Asn Gln Gln Asp Pro Asn Pro Pro Ala Pro Pro
65                  70                  75                  80
```

Thr Gln Asp Gln Gly Leu Leu Arg Lys Arg His Tyr Arg Gly Val Arg
85 90 95

Gln Arg Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg Asp Pro Gln Lys
100 105 110

Ala Ala Arg Val Trp Leu Gly Thr Phe Glu Thr Ala Glu Ala Ala Ala
115 120 125

Leu Ala Tyr Asp Asn Ala Ala Leu Lys Phe Lys Gly Ser Lys Ala Lys
130 135 140

Leu Asn Phe Pro Glu Arg Ala Gln Leu Ala Ser Asn Thr Ser Thr Thr
145 150 155 160

Thr Gly Pro Pro Asn Tyr Tyr Ser Ser Asn Asn Gln Ile Tyr Tyr Ser
165 170 175

Asn Pro Gln Thr Asn Pro Gln Thr Ile Pro Tyr Phe Asn Gln Tyr Tyr
180 185 190

Tyr Asn Gln Tyr Leu His Gln Gly Gly Asn Ser Asn Asp Ala Leu Ser
195 200 205

Tyr Ser Leu Ala Gly Gly Glu Thr Gly Gly Ser Met Tyr Asn His Gln
210 215 220

Thr Leu Ser Thr Thr Asn Ser Ser Ser Ser Gly Gly Ser Ser Arg Gln
225 230 235 240

Gln Asp Asp Glu Gln Asp Tyr Ala Arg Tyr Leu Arg Phe Gly Asp Ser
245 250 255

Ser Pro Pro Asn Ser Gly Phe
260

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<222> (94)..(1215) <223> G2557

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gccgttatta caacgaggat tgtgtttgat ccg atg gaa gga ttg gaa tct gtg 114

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                                        Met Glu Gly Leu Glu Ser Val
                                        1               5

tac gct caa gct atg tat gga atg aca cga gag agc aaa atc atg gag      162
Tyr Ala Gln Ala Met Tyr Gly Met Thr Arg Glu Ser Lys Ile Met Glu
        10                  15                  20

cat caa gga tca gat ttg att tgg gga gga aat gag cta atg gct cga      210
His Gln Gly Ser Asp Leu Ile Trp Gly Gly Asn Glu Leu Met Ala Arg
    25                  30                  35

gaa ctc tgt tct tct tct tct tat cac cac caa ctc att aat ccg aat      258
Glu Leu Cys Ser Ser Ser Ser Tyr His His Gln Leu Ile Asn Pro Asn
40                  45                  50                  55

ctt agc agc tgt ttc atg tct gat ctt gga gtc tta ggt gag att caa      306
Leu Ser Ser Cys Phe Met Ser Asp Leu Gly Val Leu Gly Glu Ile Gln
                60                  65                  70

cag cag caa cat gtt ggc aac aga gct agc tcg ata gat cca tca tca      354
Gln Gln Gln His Val Gly Asn Arg Ala Ser Ser Ile Asp Pro Ser Ser
            75                  80                  85

ctc gat tgt ttg tta tct gcg acg tcg aat agc aac aac acc tcg acg      402
Leu Asp Cys Leu Leu Ser Ala Thr Ser Asn Ser Asn Asn Thr Ser Thr
        90                  95                  100

gag gac gat gaa gga ata tct gtg ctt ttc tca gat tgt cag act ctt      450
Glu Asp Asp Glu Gly Ile Ser Val Leu Phe Ser Asp Cys Gln Thr Leu
    105                 110                 115

tgg agc ttt ggt gga gtc tca tct gca gag tct gag aac aga gag atc      498
Trp Ser Phe Gly Gly Val Ser Ser Ala Glu Ser Glu Asn Arg Glu Ile
120                 125                 130                 135

act act gag acg aca aca acg ata aag cct aag cct ttg aag aga aac      546
Thr Thr Glu Thr Thr Thr Thr Ile Lys Pro Lys Pro Leu Lys Arg Asn
                140                 145                 150

aga gga gga gat gga gga act act gag act aca aca aca aca aca aaa      594
Arg Gly Gly Asp Gly Gly Thr Thr Glu Thr Thr Thr Thr Thr Thr Lys
            155                 160                 165

cct aag tct ttg aag aga aac aga gga gac gag aca gga agt cac ttt      642
Pro Lys Ser Leu Lys Arg Asn Arg Gly Asp Glu Thr Gly Ser His Phe
        170                 175                 180

agt ctt gtt cat cct caa gat gat tcg gag aaa gga ggt ttc aag ctt      690
Ser Leu Val His Pro Gln Asp Asp Ser Glu Lys Gly Gly Phe Lys Leu
    185                 190                 195

ata tac gat gag aat caa tcg aaa tca aag aaa cca aga aca gag aaa      738
Ile Tyr Asp Glu Asn Gln Ser Lys Ser Lys Lys Pro Arg Thr Glu Lys
200                 205                 210                 215

gaa cga ggc ggt tct tcg aac att agt ttc caa cat tca act tgt ttg      786
Glu Arg Gly Gly Ser Ser Asn Ile Ser Phe Gln His Ser Thr Cys Leu
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                220                 225                 230

tct gac aat gtc gag ccc gat gct gag gcg att gca caa atg aag gag      834
Ser Asp Asn Val Glu Pro Asp Ala Glu Ala Ile Ala Gln Met Lys Glu
            235                 240                 245

atg ata tac aga gcg gct gca ttt aga ccg gtg aat ttc ggg tta gag      882
Met Ile Tyr Arg Ala Ala Ala Phe Arg Pro Val Asn Phe Gly Leu Glu
        250                 255                 260

att gtg gag aag cct aag agg aag aac gtc aag ata tcg acg gat cct      930
Ile Val Glu Lys Pro Lys Arg Lys Asn Val Lys Ile Ser Thr Asp Pro
    265                 270                 275

caa acg gtt gca gcg aga cag aga agg gag agg ata agt gag aag att      978
Gln Thr Val Ala Ala Arg Gln Arg Arg Glu Arg Ile Ser Glu Lys Ile
280                 285                 290                 295

agg gtt tta caa aca ttg gtt cca ggt ggg acg aag atg gat act gca     1026
Arg Val Leu Gln Thr Leu Val Pro Gly Gly Thr Lys Met Asp Thr Ala
                300                 305                 310

tca atg ctt gat gaa gct gct aat tat ctc aag ttc ctt aga gca caa     1074
Ser Met Leu Asp Glu Ala Ala Asn Tyr Leu Lys Phe Leu Arg Ala Gln
            315                 320                 325

gta aaa gct tta gaa aac ttg aga ccc aag ctt gac caa acc aat ctc     1122
Val Lys Ala Leu Glu Asn Leu Arg Pro Lys Leu Asp Gln Thr Asn Leu
        330                 335                 340

tct ttc tct tct gct cct aca tcg ttt cca tta ttc cac cca tct ttt     1170
Ser Phe Ser Ser Ala Pro Thr Ser Phe Pro Leu Phe His Pro Ser Phe
    345                 350                 355

ctt cca ttg caa aat cct aat caa atc cat cat cca gag tgt tga         1215
Leu Pro Leu Gln Asn Pro Asn Gln Ile His His Pro Glu Cys
360                 365                 370

cagattataa acttttgagt ttcatcatca tcaacagaat catggcgtct tgattgtttt   1275

agcagttctc aagaaaggca acttctgtga caagggtggt gtcgggcagt gttgtttaca   1335

ctttccagtc tttgttttgc atttcttttt atataaagtt tgtattttat atagaatctg   1395

tggaattcga gggttgaaat attgtgaaaa acagagccgc aagaggttaa ttacagtctc   1455

tgcaatattt tcaacctttt attactttat tagagtaaag atagcgt                 1502


<210>  290 <211>  373 <212>  PRT <213>  Arabidopsis thaliana  <400>  290

Met Glu Gly Leu Glu Ser Val Tyr Ala Gln Ala Met Tyr Gly Met Thr
1               5                   10                  15

Arg Glu Ser Lys Ile Met Glu His Gln Gly Ser Asp Leu Ile Trp Gly
            20                  25                  30
```

Gly Asn Glu Leu Met Ala Arg Glu Leu Cys Ser Ser Ser Ser Tyr His
35 40 45

His Gln Leu Ile Asn Pro Asn Leu Ser Ser Cys Phe Met Ser Asp Leu
50 55 60

Gly Val Leu Gly Glu Ile Gln Gln Gln Gln His Val Gly Asn Arg Ala
65 70 75 80

Ser Ser Ile Asp Pro Ser Ser Leu Asp Cys Leu Leu Ser Ala Thr Ser
85 90 95

Asn Ser Asn Asn Thr Ser Thr Glu Asp Asp Glu Gly Ile Ser Val Leu
100 105 110

Phe Ser Asp Cys Gln Thr Leu Trp Ser Phe Gly Gly Val Ser Ser Ala
115 120 125

Glu Ser Glu Asn Arg Glu Ile Thr Thr Glu Thr Thr Thr Thr Ile Lys
130 135 140

Pro Lys Pro Leu Lys Arg Asn Arg Gly Gly Asp Gly Gly Thr Thr Glu
145 150 155 160

Thr Thr Thr Thr Thr Thr Lys Pro Lys Ser Leu Lys Arg Asn Arg Gly
165 170 175

Asp Glu Thr Gly Ser His Phe Ser Leu Val His Pro Gln Asp Asp Ser
180 185 190

Glu Lys Gly Gly Phe Lys Leu Ile Tyr Asp Glu Asn Gln Ser Lys Ser
195 200 205

Lys Lys Pro Arg Thr Glu Lys Glu Arg Gly Gly Ser Ser Asn Ile Ser
210 215 220

Phe Gln His Ser Thr Cys Leu Ser Asp Asn Val Glu Pro Asp Ala Glu
225 230 235 240

Ala Ile Ala Gln Met Lys Glu Met Ile Tyr Arg Ala Ala Ala Phe Arg
245 250 255

Pro Val Asn Phe Gly Leu Glu Ile Val Glu Lys Pro Lys Arg Lys Asn
260 265 270

Val Lys Ile Ser Thr Asp Pro Gln Thr Val Ala Ala Arg Gln Arg Arg
275 280 285

Glu Arg Ile Ser Glu Lys Ile Arg Val Leu Gln Thr Leu Val Pro Gly
290 295 300

Gly Thr Lys Met Asp Thr Ala Ser Met Leu Asp Glu Ala Ala Asn Tyr
305 310 315 320

Leu Lys Phe Leu Arg Ala Gln Val Lys Ala Leu Glu Asn Leu Arg Pro
325 330 335

Lys Leu Asp Gln Thr Asn Leu Ser Phe Ser Ser Ala Pro Thr Ser Phe
340 345 350

Pro Leu Phe His Pro Ser Phe Leu Pro Leu Gln Asn Pro Asn Gln Ile
355 360 365

His His Pro Glu Cys
370

<210> 291 <211> 1699 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (417)..(1421) <223> G5

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ttttttttttt gcaatctccc cctaatctgt tgtttctcgc ttcttcttct gttaatcatc 60

tgtctttcaa aaagaaagaa aaaagaaaaa ttcgatttct gggtttgttt ttgtcataca 120

gaaaaaaatc aagcttatga atttgtgttt aatttttttgt tttaatttga aaggcaggtt 180

ttttcagaac gagatcgttt tttcaaattt cttctgattt tacctctttt tttcttctta 240

gattttagtg aatcgagggt gaaatttttg attccctctt ttcggatcta cacagaggtt 300

gcttatttca aacctttttag atccattttt ttttaatttt ctcggaaaaa tccctgtttc 360

tttacttttt tataagtctc aggttcaatt ttttcggatt caaattttta ttttaa atg 419
Met
1

gca gct gct atg aat ttg tac act tgt agc aga tcg ttt caa gac tct 467
Ala Ala Ala Met Asn Leu Tyr Thr Cys Ser Arg Ser Phe Gln Asp Ser
5 10 15

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ggt ggt gaa ctc atg gac gcg ctt gta cct ttt atc aaa agc gtt tcc      515
Gly Gly Glu Leu Met Asp Ala Leu Val Pro Phe Ile Lys Ser Val Ser
        20                  25                  30

gat tct cct tct tct tct tct gca gcg tct gcg tct gcg ttt ctt cac      563
Asp Ser Pro Ser Ser Ser Ser Ala Ala Ser Ala Ser Ala Phe Leu His
    35                  40                  45

ccc tct gcg ttt tct ctc cct cct ctc ccc ggt tat tac ccg gat tca      611
Pro Ser Ala Phe Ser Leu Pro Pro Leu Pro Gly Tyr Tyr Pro Asp Ser
50                  55                  60                  65

acg ttc ttg acc caa ccg ttt tca tac ggg tcg gat ctt caa caa acc      659
Thr Phe Leu Thr Gln Pro Phe Ser Tyr Gly Ser Asp Leu Gln Gln Thr
                70                  75                  80

ggg tca tta atc gga ctc aac aac ctc tct tct tct cag atc cac cag      707
Gly Ser Leu Ile Gly Leu Asn Asn Leu Ser Ser Ser Gln Ile His Gln
            85                  90                  95

atc cag tct cag atc cat cat cct ctt cct ccg acg cat cac aac aac      755
Ile Gln Ser Gln Ile His His Pro Leu Pro Pro Thr His His Asn Asn
        100                 105                 110

aac aac tct ttc tcg aat ctt ctc agc cca aag ccg tta ctg atg aag      803
Asn Asn Ser Phe Ser Asn Leu Leu Ser Pro Lys Pro Leu Leu Met Lys
    115                 120                 125

caa tct gga gtc gct gga tct tgt ttc gct tac ggt tca ggt gtt cct      851
Gln Ser Gly Val Ala Gly Ser Cys Phe Ala Tyr Gly Ser Gly Val Pro
130                 135                 140                 145

tcg aag ccg acg aag ctt tac aga ggt gtg agg caa cgt cac tgg gga      899
Ser Lys Pro Thr Lys Leu Tyr Arg Gly Val Arg Gln Arg His Trp Gly
                150                 155                 160

aaa tgg gtg gct gag atc cgt ttg ccg aga aat cgg act cgt ctc tgg      947
Lys Trp Val Ala Glu Ile Arg Leu Pro Arg Asn Arg Thr Arg Leu Trp
            165                 170                 175

ctt ggg act ttt gac acg gcg gag gaa gct gcg ttg gcc tat gat aag      995
Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala Ala Leu Ala Tyr Asp Lys
        180                 185                 190

gcg gcg tac aag ctg cgc ggc gat ttc gcc cgg ctt aac ttc cct aac     1043
Ala Ala Tyr Lys Leu Arg Gly Asp Phe Ala Arg Leu Asn Phe Pro Asn
    195                 200                 205

cta cgt cat aac gga ttt cac atc gga ggc gat ttc ggt gaa tat aaa     1091
Leu Arg His Asn Gly Phe His Ile Gly Gly Asp Phe Gly Glu Tyr Lys
210                 215                 220                 225

cct ctt cac tcc tca gtc gac gct aag ctt gaa gct att tgt aaa agc     1139
Pro Leu His Ser Ser Val Asp Ala Lys Leu Glu Ala Ile Cys Lys Ser
                230                 235                 240

atg gcg gag act cag aaa cag gac aaa tcg acg aaa tca tcg aag aaa     1187
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Met Ala Glu Thr Gln Lys Gln Asp Lys Ser Thr Lys Ser Ser Lys Lys
            245                 250                 255

cgt gag aag aag gtt tcg tcg cca gat cta tcg gag aaa gtg aag gcg     1235
Arg Glu Lys Lys Val Ser Ser Pro Asp Leu Ser Glu Lys Val Lys Ala
        260                 265                 270

gag gag aat tcg gtt tcg atc ggt gga tct cca ccg gtg acg gag ttt     1283
Glu Glu Asn Ser Val Ser Ile Gly Gly Ser Pro Pro Val Thr Glu Phe
    275                 280                 285

gaa gag tcc acc gct gga tct tcg ccg ttg tcg gac ttg acg ttc gct     1331
Glu Glu Ser Thr Ala Gly Ser Ser Pro Leu Ser Asp Leu Thr Phe Ala
290                 295                 300                 305

gac ccg gag gag ccg ccg cag tgg aac gag acg ttc tcg ttg gag aag     1379
Asp Pro Glu Glu Pro Pro Gln Trp Asn Glu Thr Phe Ser Leu Glu Lys
                310                 315                 320

tat ccg tcg tac gag atc gat tgg gat tcg att cta gct tag             1421
Tyr Pro Ser Tyr Glu Ile Asp Trp Asp Ser Ile Leu Ala
            325                 330

gggcaaaata ggaaattcag ccgcttgcaa tggagttttt gtgaaattgc atgactggcc   1481

caagagtaat taattaaata tggattagtg ttaaatttcg tatgttaata tttgtattat   1541

ggtttgtatt agtctctctg tgtcggtcca gcttgcggtt ttttgtcagg ctcgaccatg   1601

ccacagtttt cattttatgt aatctttttt tcttttgtct tatgtaattt gtagcttcag   1661

tttcttcatc tataatgcaa ttttattatg attatgtg                           1699


<210>  292 <211>  334 <212>  PRT <213>  Arabidopsis thaliana  <400>  292

Met Ala Ala Ala Met Asn Leu Tyr Thr Cys Ser Arg Ser Phe Gln Asp
1               5                   10                  15

Ser Gly Gly Glu Leu Met Asp Ala Leu Val Pro Phe Ile Lys Ser Val
            20                  25                  30

Ser Asp Ser Pro Ser Ser Ser Ser Ala Ala Ser Ala Ser Ala Phe Leu
        35                  40                  45

His Pro Ser Ala Phe Ser Leu Pro Pro Leu Pro Gly Tyr Tyr Pro Asp
    50                  55                  60

Ser Thr Phe Leu Thr Gln Pro Phe Ser Tyr Gly Ser Asp Leu Gln Gln
65                  70                  75                  80

Thr Gly Ser Leu Ile Gly Leu Asn Asn Leu Ser Ser Ser Gln Ile His
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                85                  90                  95

Gln Ile Gln Ser Gln Ile His His Pro Leu Pro Pro Thr His His Asn
            100                 105                 110

Asn Asn Asn Ser Phe Ser Asn Leu Leu Ser Pro Lys Pro Leu Leu Met
        115                 120                 125

Lys Gln Ser Gly Val Ala Gly Ser Cys Phe Ala Tyr Gly Ser Gly Val
    130                 135                 140

Pro Ser Lys Pro Thr Lys Leu Tyr Arg Gly Val Arg Gln Arg His Trp
145                 150                 155                 160

Gly Lys Trp Val Ala Glu Ile Arg Leu Pro Arg Asn Arg Thr Arg Leu
                165                 170                 175

Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala Ala Leu Ala Tyr Asp
            180                 185                 190

Lys Ala Ala Tyr Lys Leu Arg Gly Asp Phe Ala Arg Leu Asn Phe Pro
        195                 200                 205

Asn Leu Arg His Asn Gly Phe His Ile Gly Gly Asp Phe Gly Glu Tyr
    210                 215                 220

Lys Pro Leu His Ser Ser Val Asp Ala Lys Leu Glu Ala Ile Cys Lys
225                 230                 235                 240

Ser Met Ala Glu Thr Gln Lys Gln Asp Lys Ser Thr Lys Ser Ser Lys
                245                 250                 255

Lys Arg Glu Lys Lys Val Ser Ser Pro Asp Leu Ser Glu Lys Val Lys
            260                 265                 270

Ala Glu Glu Asn Ser Val Ser Ile Gly Gly Ser Pro Pro Val Thr Glu
        275                 280                 285

Phe Glu Glu Ser Thr Ala Gly Ser Ser Pro Leu Ser Asp Leu Thr Phe
    290                 295                 300

Ala Asp Pro Glu Glu Pro Pro Gln Trp Asn Glu Thr Phe Ser Leu Glu
305                 310                 315                 320
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Lys Tyr Pro Ser Tyr Glu Ile Asp Trp Asp Ser Ile Leu Ala
                325                 330


<210>  293 <211>  970 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (22)..(732) <223>  G23

 <400>  293
tatcaaacga gagtacaaaa g atg acg tca ctc aac agc tct gca tca cca       51
                        Met Thr Ser Leu Asn Ser Ser Ala Ser Pro
                        1               5                   10

aca tca tcg tca tca gac caa tct gat gca act act aca aca agc acc       99
Thr Ser Ser Ser Ser Asp Gln Ser Asp Ala Thr Thr Thr Thr Ser Thr
                15                  20                  25

cac ttg tct gaa gaa gaa gct cca ccc aga aac aac aac aca aga aag      147
His Leu Ser Glu Glu Glu Ala Pro Pro Arg Asn Asn Asn Thr Arg Lys
            30                  35                  40

aga agg aga gat tct tct tct gct tct tca tct tct tca atg caa cat      195
Arg Arg Arg Asp Ser Ser Ser Ala Ser Ser Ser Ser Ser Met Gln His
        45                  50                  55

cct gtt tac aga ggt gtg cgg atg aga agt tgg ggc aaa tgg gtc tcc      243
Pro Val Tyr Arg Gly Val Arg Met Arg Ser Trp Gly Lys Trp Val Ser
    60                  65                  70

gag atc cga caa cct cgt aag aaa act cgt att tgg ctc ggc act ttt      291
Glu Ile Arg Gln Pro Arg Lys Lys Thr Arg Ile Trp Leu Gly Thr Phe
75                  80                  85                  90

gtc acc gct gat atg gct gct cgt gct cac gac gtc gct gct ctc acc      339
Val Thr Ala Asp Met Ala Ala Arg Ala His Asp Val Ala Ala Leu Thr
                95                  100                 105

atc aaa ggc tcc tcc gcc gtc tta aat ttc cct gag ctt gct tct ctc      387
Ile Lys Gly Ser Ser Ala Val Leu Asn Phe Pro Glu Leu Ala Ser Leu
            110                 115                 120

ttc cct cgt ccg gcg tca tca tcg ccg cat gat atc cag aca gcc gcc      435
Phe Pro Arg Pro Ala Ser Ser Ser Pro His Asp Ile Gln Thr Ala Ala
        125                 130                 135

gca gaa gcc gcc gcc atg gtg gtc gaa gaa aaa ctg tta gag aag gat      483
Ala Glu Ala Ala Ala Met Val Val Glu Glu Lys Leu Leu Glu Lys Asp
    140                 145                 150

gag gct ccg gag gcc cca cct tcg tcg gaa tct tct tac gtg gcg gcg      531
Glu Ala Pro Glu Ala Pro Pro Ser Ser Glu Ser Ser Tyr Val Ala Ala
155                 160                 165                 170

gag tca gag gat gag gag agg ttg gag aaa att gtg gag ctg cct aac      579
Glu Ser Glu Asp Glu Glu Arg Leu Glu Lys Ile Val Glu Leu Pro Asn
                175                 180                 185
```

att gaa gaa gga agt tat gac gag agt gtg aca tca cgt gct gat ctg 627
Ile Glu Glu Gly Ser Tyr Asp Glu Ser Val Thr Ser Arg Ala Asp Leu
190 195 200

gct tat tct gag ccg ttc gat tgt tgg gtg tat cct ccg gtt atg gat 675
Ala Tyr Ser Glu Pro Phe Asp Cys Trp Val Tyr Pro Pro Val Met Asp
205 210 215

ttt tat gaa gaa ata tcg gag ttt aat ttc gtg gaa ttg tgg agc ttt 723
Phe Tyr Glu Glu Ile Ser Glu Phe Asn Phe Val Glu Leu Trp Ser Phe
220 225 230

aat cac taa ttaagttagg aaagtgcatt atattgcaat attgcatcat 772
Asn His
235

agataacatt tgtatttctt ttctttttgt acggatacgt agcatatgct actatactag 832

ggctagtgta ccaaatattg taaaatatac ttattaatat ttatgtaaat gtgtaatata 892

tataacatac aattattgta agtttggaaa ttggaaacta tcgttacgca atgttcttgt 952

aaaaaaaaaa aaaaaaaa 970

<210> 294 <211> 236 <212> PRT <213> Arabidopsis thaliana <400> 294

Met Thr Ser Leu Asn Ser Ser Ala Ser Pro Thr Ser Ser Ser Ser Asp
1 5 10 15

Gln Ser Asp Ala Thr Thr Thr Thr Ser Thr His Leu Ser Glu Glu Glu
20 25 30

Ala Pro Pro Arg Asn Asn Asn Thr Arg Lys Arg Arg Arg Asp Ser Ser
35 40 45

Ser Ala Ser Ser Ser Ser Ser Met Gln His Pro Val Tyr Arg Gly Val
50 55 60

Arg Met Arg Ser Trp Gly Lys Trp Val Ser Glu Ile Arg Gln Pro Arg
65 70 75 80

Lys Lys Thr Arg Ile Trp Leu Gly Thr Phe Val Thr Ala Asp Met Ala
85 90 95

Ala Arg Ala His Asp Val Ala Ala Leu Thr Ile Lys Gly Ser Ser Ala
100 105 110

Val Leu Asn Phe Pro Glu Leu Ala Ser Leu Phe Pro Arg Pro Ala Ser

```
        115                 120                 125

Ser Ser Pro His Asp Ile Gln Thr Ala Ala Ala Glu Ala Ala Ala Met
    130                 135                 140

Val Val Glu Glu Lys Leu Leu Glu Lys Asp Glu Ala Pro Glu Ala Pro
145                 150                 155                 160

Pro Ser Ser Glu Ser Ser Tyr Val Ala Ala Glu Ser Glu Asp Glu Glu
                165                 170                 175

Arg Leu Glu Lys Ile Val Glu Leu Pro Asn Ile Glu Glu Gly Ser Tyr
            180                 185                 190

Asp Glu Ser Val Thr Ser Arg Ala Asp Leu Ala Tyr Ser Glu Pro Phe
        195                 200                 205

Asp Cys Trp Val Tyr Pro Pro Val Met Asp Phe Tyr Glu Glu Ile Ser
    210                 215                 220

Glu Phe Asn Phe Val Glu Leu Trp Ser Phe Asn His
225                 230                 235
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<210> 295 <211> 1418 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (192)..(1205) <223> G194

<400> 295

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tctttcttct ctctctatct ctcctctttg aaccctaaaa actctttctt tacaaggatt     60

gatctttttg tatttttgat tttgacattt gctttgtgtt cgatctctgt tttgatgcga    120

tttctctgtt tttaaagcca tttgatagat tgtttccggt aaagctcagc gagagaagaa    180

gaagaacaac a atg gag ttt aca gat ttc tca aag acg agt ttt tac tac     230
            Met Glu Phe Thr Asp Phe Ser Lys Thr Ser Phe Tyr Tyr
            1               5                   10

ccg tcg tca caa agc gtt tgg gat ttc gga gat tta gcg gcg gcg gag      278
Pro Ser Ser Gln Ser Val Trp Asp Phe Gly Asp Leu Ala Ala Ala Glu
    15                  20                  25

agg cat tct tta ggg ttc atg gag tta tta agt tct cag cag cat caa      326
Arg His Ser Leu Gly Phe Met Glu Leu Leu Ser Ser Gln Gln His Gln
30                  35                  40                  45

gac ttt gct act gtt tct cct cat tcc ttc ctt ctc caa acg tct caa      374
Asp Phe Ala Thr Val Ser Pro His Ser Phe Leu Leu Gln Thr Ser Gln
                50                  55                  60
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ccg caa acg caa acg caa cca tcg gcg aag ctg tct tca agt atc att      422
Pro Gln Thr Gln Thr Gln Pro Ser Ala Lys Leu Ser Ser Ser Ile Ile
            65                  70                  75

caa gct cca ccg tca gag caa tta gtg acg tca aag gtg gag tct ttg      470
Gln Ala Pro Pro Ser Glu Gln Leu Val Thr Ser Lys Val Glu Ser Leu
        80                  85                  90

tgt tcg gat cat ttg ttg ata aac cca ccg gcg act cct aac tcg tca      518
Cys Ser Asp His Leu Leu Ile Asn Pro Pro Ala Thr Pro Asn Ser Ser
    95                  100                 105

tcg att tcg tct gct tca agc gag gct cta aat gaa gag aaa ccg aaa      566
Ser Ile Ser Ser Ala Ser Ser Glu Ala Leu Asn Glu Glu Lys Pro Lys
110                 115                 120                 125

aca gaa gac aat gaa gaa gaa gga ggt gaa gat caa caa gag aag agt      614
Thr Glu Asp Asn Glu Glu Glu Gly Gly Glu Asp Gln Gln Glu Lys Ser
                130                 135                 140

cat act aag aaa cag ttg aaa gca aag aag aat aat cag aag aga cag      662
His Thr Lys Lys Gln Leu Lys Ala Lys Lys Asn Asn Gln Lys Arg Gln
            145                 150                 155

aga gag gca aga gtc gca ttc atg aca aag agt gaa gtt gat cat ctc      710
Arg Glu Ala Arg Val Ala Phe Met Thr Lys Ser Glu Val Asp His Leu
        160                 165                 170

gaa gat ggt tat cgc tgg cga aaa tat ggt caa aaa gct gtc aaa aac      758
Glu Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ala Val Lys Asn
    175                 180                 185

agt cct ttt ccc agg agt tac tac cgt tgc aca acg gct tca tgt aac      806
Ser Pro Phe Pro Arg Ser Tyr Tyr Arg Cys Thr Thr Ala Ser Cys Asn
190                 195                 200                 205

gtg aag aag aga gtg gag aga tca ttc aga gat cca agc act gtg gtt      854
Val Lys Lys Arg Val Glu Arg Ser Phe Arg Asp Pro Ser Thr Val Val
                210                 215                 220

aca acc tac gaa ggt caa cac act cac att agt cca ctc acg tct cgt      902
Thr Thr Tyr Glu Gly Gln His Thr His Ile Ser Pro Leu Thr Ser Arg
            225                 230                 235

cct att tcc act gga ggt ttc ttc gga tcg tca gga gct gct tcg agt      950
Pro Ile Ser Thr Gly Gly Phe Phe Gly Ser Ser Gly Ala Ala Ser Ser
        240                 245                 250

ctc ggt aat ggt tgc ttt ggg ttt cct att gat ggc tcc acg tta atc      998
Leu Gly Asn Gly Cys Phe Gly Phe Pro Ile Asp Gly Ser Thr Leu Ile
    255                 260                 265

tct cct cag ttc caa cag ctt gtc caa tac cat cac caa cag cag caa     1046
Ser Pro Gln Phe Gln Gln Leu Val Gln Tyr His His Gln Gln Gln Gln
270                 275                 280                 285

caa gaa ctc atg tct tgt ttt gga gga gtc aac gag tac ctt aat agc     1094
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Gln Glu Leu Met Ser Cys Phe Gly Gly Val Asn Glu Tyr Leu Asn Ser
                290                 295                 300

cac gct aat gag tat ggt gat gat aat cgt gtg aag aag agt cga gtt     1142
His Ala Asn Glu Tyr Gly Asp Asp Asn Arg Val Lys Lys Ser Arg Val
            305                 310                 315

ttg gtt aaa gat aat gga ctt ctg caa gat gtt gtt ccg tct cat atg     1190
Leu Val Lys Asp Asn Gly Leu Leu Gln Asp Val Val Pro Ser His Met
        320                 325                 330

ttg aag gaa gag tag tagtatatat atagtcttat agttttaatc tagttttttt     1245
Leu Lys Glu Glu
    335

ttgtataatt gtctaaaaga aacggatctt ttgttctgat gaagaagatg ttttcttatg   1305

gttctgaaat cgtaaggtaa tgatgattgt accaagccga gaaagtactt gtgattttca   1365

ccattgaatc actataaatg taatttttat ttactgtgaa aaaaaaaaaa aaa          1418


<210>  296 <211>  337 <212>  PRT <213>  Arabidopsis thaliana  <400>  296

Met Glu Phe Thr Asp Phe Ser Lys Thr Ser Phe Tyr Tyr Pro Ser Ser
1               5                   10                  15

Gln Ser Val Trp Asp Phe Gly Asp Leu Ala Ala Ala Glu Arg His Ser
            20                  25                  30

Leu Gly Phe Met Glu Leu Leu Ser Ser Gln Gln His Gln Asp Phe Ala
        35                  40                  45

Thr Val Ser Pro His Ser Phe Leu Leu Gln Thr Ser Gln Pro Gln Thr
    50                  55                  60

Gln Thr Gln Pro Ser Ala Lys Leu Ser Ser Ser Ile Ile Gln Ala Pro
65                  70                  75                  80

Pro Ser Glu Gln Leu Val Thr Ser Lys Val Glu Ser Leu Cys Ser Asp
                85                  90                  95

His Leu Leu Ile Asn Pro Pro Ala Thr Pro Asn Ser Ser Ser Ile Ser
            100                 105                 110

Ser Ala Ser Ser Glu Ala Leu Asn Glu Glu Lys Pro Lys Thr Glu Asp
        115                 120                 125

Asn Glu Glu Glu Gly Gly Glu Asp Gln Gln Glu Lys Ser His Thr Lys
```

130 135 140

Lys Gln Leu Lys Ala Lys Lys Asn Asn Gln Lys Arg Gln Arg Glu Ala
145 150 155 160

Arg Val Ala Phe Met Thr Lys Ser Glu Val Asp His Leu Glu Asp Gly
165 170 175

Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ala Val Lys Asn Ser Pro Phe
180 185 190

Pro Arg Ser Tyr Tyr Arg Cys Thr Thr Ala Ser Cys Asn Val Lys Lys
195 200 205

Arg Val Glu Arg Ser Phe Arg Asp Pro Ser Thr Val Val Thr Thr Tyr
210 215 220

Glu Gly Gln His Thr His Ile Ser Pro Leu Thr Ser Arg Pro Ile Ser
225 230 235 240

Thr Gly Gly Phe Phe Gly Ser Ser Gly Ala Ala Ser Ser Leu Gly Asn
245 250 255

Gly Cys Phe Gly Phe Pro Ile Asp Gly Ser Thr Leu Ile Ser Pro Gln
260 265 270

Phe Gln Gln Leu Val Gln Tyr His His Gln Gln Gln Gln Gln Glu Leu
275 280 285

Met Ser Cys Phe Gly Gly Val Asn Glu Tyr Leu Asn Ser His Ala Asn
290 295 300

Glu Tyr Gly Asp Asp Asn Arg Val Lys Lys Ser Arg Val Leu Val Lys
305 310 315 320

Asp Asn Gly Leu Leu Gln Asp Val Val Pro Ser His Met Leu Lys Glu
325 330 335

Glu

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Met Arg Pro Ile Leu Asp Leu Glu Ile Glu Ala Ser Ser Gly Ser Ser
1               5                   10                  15

agc agc caa gtg gcc tca aac ttg tct ccg gtt ggg gaa gat tac aaa       96
Ser Ser Gln Val Ala Ser Asn Leu Ser Pro Val Gly Glu Asp Tyr Lys
            20                  25                  30

cca atc tcg ctg aat ctt agc ctc agt ttc aac aac aac aac aac aat      144
Pro Ile Ser Leu Asn Leu Ser Leu Ser Phe Asn Asn Asn Asn Asn Asn
        35                  40                  45

aat ctg gat ctt gaa tca tcg tct ttg acg ctg cca ctt tcg agc acg      192
Asn Leu Asp Leu Glu Ser Ser Ser Leu Thr Leu Pro Leu Ser Ser Thr
    50                  55                  60

agt gag agt agt aac ccg gag cag cag cag caa caa caa cca tct gta      240
Ser Glu Ser Ser Asn Pro Glu Gln Gln Gln Gln Gln Pro Ser Val
65                  70                  75                  80

tca aag aga gtc ttc tct tgt aac tac tgc caa agg aag ttc tat agc      288
Ser Lys Arg Val Phe Ser Cys Asn Tyr Cys Gln Arg Lys Phe Tyr Ser
                85                  90                  95

tct caa gcg cta ggt ggt cac caa aac gct cac aaa cgt gag aga aca      336
Ser Gln Ala Leu Gly Gly His Gln Asn Ala His Lys Arg Glu Arg Thr
            100                 105                 110

ctc gcc aaa cgc gct atg cta tgg gtc ttg ctg ggg tct tcc ccg gta      384
Leu Ala Lys Arg Ala Met Leu Trp Val Leu Leu Gly Ser Ser Pro Val
        115                 120                 125

gag gat caa gta gca att atg cgg ctg ctg cca cag cag ccg ctc tcg      432
Glu Asp Gln Val Ala Ile Met Arg Leu Leu Pro Gln Gln Pro Leu Ser
    130                 135                 140

tgt ttg ccg ctt cac gga agc gga aac ggg aac atg aca tcg ttc agg      480
Cys Leu Pro Leu His Gly Ser Gly Asn Gly Asn Met Thr Ser Phe Arg
145                 150                 155                 160

act ttg gga atc cgg gca cat tcc tcg gcg cac gac gtc agc atg aca      528
Thr Leu Gly Ile Arg Ala His Ser Ser Ala His Asp Val Ser Met Thr
                165                 170                 175

agg cag aca cca gaa aca ctt att aga aac att gcc agg ttc aac cag      576
Arg Gln Thr Pro Glu Thr Leu Ile Arg Asn Ile Ala Arg Phe Asn Gln
            180                 185                 190

ggg tat ttc ggt aat tgt ata cct ttt tac gtg gag gac gac gag gcc      624
Gly Tyr Phe Gly Asn Cys Ile Pro Phe Tyr Val Glu Asp Asp Glu Ala
        195                 200                 205

gag atg ctc tgg ccg ggg agt ttc cgg caa gct acg aat gcg gtt gcg      672
Glu Met Leu Trp Pro Gly Ser Phe Arg Gln Ala Thr Asn Ala Val Ala
    210                 215                 220
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Patent Application Publication Sep. 15, 2005

gtt gaa gcg ggt aat gat aat tta ggt gaa aga aaa atg gat ttc ttg 720
Val Glu Ala Gly Asn Asp Asn Leu Gly Glu Arg Lys Met Asp Phe Leu
225 230 235 240

gac gtc aag caa gcg atg gat atg gaa agt tct ctt cca gat cta acc 768
Asp Val Lys Gln Ala Met Asp Met Glu Ser Ser Leu Pro Asp Leu Thr
245 250 255

ttg aag ctt tga 780
Leu Lys Leu

<210> 298 <211> 259 <212> PRT <213> Arabidopsis thaliana <400> 298

Met Arg Pro Ile Leu Asp Leu Glu Ile Glu Ala Ser Ser Gly Ser Ser
1 5 10 15

Ser Ser Gln Val Ala Ser Asn Leu Ser Pro Val Gly Glu Asp Tyr Lys
20 25 30

Pro Ile Ser Leu Asn Leu Ser Leu Ser Phe Asn Asn Asn Asn Asn Asn
35 40 45

Asn Leu Asp Leu Glu Ser Ser Ser Leu Thr Leu Pro Leu Ser Ser Thr
50 55 60

Ser Glu Ser Ser Asn Pro Glu Gln Gln Gln Gln Gln Pro Ser Val
65 70 75 80

Ser Lys Arg Val Phe Ser Cys Asn Tyr Cys Gln Arg Lys Phe Tyr Ser
85 90 95

Ser Gln Ala Leu Gly Gly His Gln Asn Ala His Lys Arg Glu Arg Thr
100 105 110

Leu Ala Lys Arg Ala Met Leu Trp Val Leu Leu Gly Ser Ser Pro Val
115 120 125

Glu Asp Gln Val Ala Ile Met Arg Leu Leu Pro Gln Gln Pro Leu Ser
130 135 140

Cys Leu Pro Leu His Gly Ser Gly Asn Gly Asn Met Thr Ser Phe Arg
145 150 155 160

Thr Leu Gly Ile Arg Ala His Ser Ser Ala His Asp Val Ser Met Thr

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                165                 170                 175

Arg Gln Thr Pro Glu Thr Leu Ile Arg Asn Ile Ala Arg Phe Asn Gln
            180                 185                 190

Gly Tyr Phe Gly Asn Cys Ile Pro Phe Tyr Val Glu Asp Asp Glu Ala
        195                 200                 205

Glu Met Leu Trp Pro Gly Ser Phe Arg Gln Ala Thr Asn Ala Val Ala
    210                 215                 220

Val Glu Ala Gly Asn Asp Asn Leu Gly Glu Arg Lys Met Asp Phe Leu
225                 230                 235                 240

Asp Val Lys Gln Ala Met Asp Met Glu Ser Ser Leu Pro Asp Leu Thr
                245                 250                 255

Leu Lys Leu
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09/25/2006 15:50 FAX

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ttctctcgaa atctctctca acaaacccag aaactttcct tgattcgcaa gcttttcttc    180

cttttatatt cttcattttg atgcgaatat agagagagtc cataaaagaa acagta atg    239
                                                              Met
                                                               1

gac gaa tat att gat ttc cga cca ttg aag tac aca gag cac aag act      287
Asp Glu Tyr Ile Asp Phe Arg Pro Leu Lys Tyr Thr Glu His Lys Thr
            5                   10                  15

tca atg act aaa tac acc aaa aag tca tcg gaa aaa ctt tcc ggt ggt      335
Ser Met Thr Lys Tyr Thr Lys Lys Ser Ser Glu Lys Leu Ser Gly Gly
        20                  25                  30

aag tca ttg aaa aag gtt agt att tgt tat act gat cct gac gca aca      383
Lys Ser Leu Lys Lys Val Ser Ile Cys Tyr Thr Asp Pro Asp Ala Thr
    35                  40                  45

gat tca tca agt gac gaa gac gaa gaa gat ttc ttg ttt cct cgc cgg      431
Asp Ser Ser Ser Asp Glu Asp Glu Glu Asp Phe Leu Phe Pro Arg Arg
50                  55                  60                  65
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aga gtc aaa aga ttc gtt aac gag atc act gtt gag cct agc tgt aac      479
Arg Val Lys Arg Phe Val Asn Glu Ile Thr Val Glu Pro Ser Cys Asn
                70                  75                  80

aac gtc gtc acc gga gtt tcg atg aaa gat aga aag aga ctc tct tct      527
Asn Val Val Thr Gly Val Ser Met Lys Asp Arg Lys Arg Leu Ser Ser
            85                  90                  95

tcc tcc gat gaa act caa tct ccg gcg tcg agt cgt caa cgt cct aat      575
Ser Ser Asp Glu Thr Gln Ser Pro Ala Ser Ser Arg Gln Arg Pro Asn
        100                 105                 110

aac aaa gtt tca gtc tcc ggt cag ata aag aag ttc cgt ggt gtt aga      623
Asn Lys Val Ser Val Ser Gly Gln Ile Lys Lys Phe Arg Gly Val Arg
    115                 120                 125

caa cgg cca tgg ggg aaa tgg gcg gcg gag att aga gat ccg gag caa      671
Gln Arg Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg Asp Pro Glu Gln
130                 135                 140                 145

cgt cgg agg att tgg ctc ggg act ttt gag acg gcg gag gaa gct gcc      719
Arg Arg Arg Ile Trp Leu Gly Thr Phe Glu Thr Ala Glu Glu Ala Ala
                150                 155                 160

gtg gtt tat gat aac gcc gct ata aga ctc cgt gga ccg gac gct tta      767
Val Val Tyr Asp Asn Ala Ala Ile Arg Leu Arg Gly Pro Asp Ala Leu
            165                 170                 175

act aat ttc tcc ata ccg cct caa gaa gag gaa gaa gaa gaa gaa ccg      815
Thr Asn Phe Ser Ile Pro Pro Gln Glu Glu Glu Glu Glu Glu Glu Pro
        180                 185                 190

gaa ccg gtt att gag gag aaa ccg gtt att atg acg acg cca aca cca      863
Glu Pro Val Ile Glu Glu Lys Pro Val Ile Met Thr Thr Pro Thr Pro
    195                 200                 205

aca aca tcg agt tct gaa tca act gaa gaa gat tta caa cat ctc tca      911
Thr Thr Ser Ser Ser Glu Ser Thr Glu Glu Asp Leu Gln His Leu Ser
210                 215                 220                 225

tct cct act tcg gtt ctc aat cac cgg tca gaa gag att caa caa gta      959
Ser Pro Thr Ser Val Leu Asn His Arg Ser Glu Glu Ile Gln Gln Val
                230                 235                 240

caa caa ccg ttt aaa tca gct aaa ccc gaa ccg ggg gtt tca aat gca     1007
Gln Gln Pro Phe Lys Ser Ala Lys Pro Glu Pro Gly Val Ser Asn Ala
            245                 250                 255

cca tgg tgg cat acc ggg ttt aat acc ggt tta ggt gaa tca gac gat     1055
Pro Trp Trp His Thr Gly Phe Asn Thr Gly Leu Gly Glu Ser Asp Asp
        260                 265                 270

tca ttt cct ttg gat act ccg ttt ctt gac aac tat ttc aat gaa tca     1103
Ser Phe Pro Leu Asp Thr Pro Phe Leu Asp Asn Tyr Phe Asn Glu Ser
    275                 280                 285

cca cca gag atg tca ata ttt gac caa cca atg gat caa att ttc tgt     1151
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Pro Pro Glu Met Ser Ile Phe Asp Gln Pro Met Asp Gln Ile Phe Cys
290                 295                 300                 305

gaa aat gat gat atc ttc aat gat atg ttg ttc ttg ggt ggt gaa act     1199
Glu Asn Asp Asp Ile Phe Asn Asp Met Leu Phe Leu Gly Gly Glu Thr
                310                 315                 320

atg aac att gaa gat gag tta aca agt tct agt atc aaa gat atg ggt     1247
Met Asn Ile Glu Asp Glu Leu Thr Ser Ser Ser Ile Lys Asp Met Gly
            325                 330                 335

tca acg ttt agt gat ttt gat gat tca ttg ata tca gat cta tta gtt     1295
Ser Thr Phe Ser Asp Phe Asp Asp Ser Leu Ile Ser Asp Leu Leu Val
        340                 345                 350

gct taa tatgatgatg agagtgaaga agaaaccatc aagcaaatat ctatggtgtg      1351
Ala

actgaaaaat tttggtgtta ctttttttttc tttcataagt tcatgagctt ttttgtttct   1411

ttttttttaat aatttattta gttttgtcag gagcttgtaa aacagttttg gagaaatagt   1471

ggaaaaatag tttaattaaa aaaaaaaaaa aaaaaa                              1507

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Met Asp Glu Tyr Ile Asp Phe Arg Pro Leu Lys Tyr Thr Glu His Lys
1               5                   10                  15

Thr Ser Met Thr Lys Tyr Thr Lys Lys Ser Ser Glu Lys Leu Ser Gly
            20                  25                  30

Gly Lys Ser Leu Lys Lys Val Ser Ile Cys Tyr Thr Asp Pro Asp Ala
        35                  40                  45

Thr Asp Ser Ser Ser Asp Glu Asp Glu Glu Asp Phe Leu Phe Pro Arg
    50                  55                  60

Arg Arg Val Lys Arg Phe Val Asn Glu Ile Thr Val Glu Pro Ser Cys
65                  70                  75                  80

Asn Asn Val Val Thr Gly Val Ser Met Lys Asp Arg Lys Arg Leu Ser
                85                  90                  95

Ser Ser Ser Asp Glu Thr Gln Ser Pro Ala Ser Ser Arg Gln Arg Pro
            100                 105                 110

Asn Asn Lys Val Ser Val Ser Gly Gln Ile Lys Lys Phe Arg Gly Val
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Replacement Sheet

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        115                 120                 125

Arg Gln Arg Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg Asp Pro Glu
    130                 135                 140

Gln Arg Arg Arg Ile Trp Leu Gly Thr Phe Glu Thr Ala Glu Glu Ala
145                 150                 155                 160

Ala Val Val Tyr Asp Asn Ala Ala Ile Arg Leu Arg Gly Pro Asp Ala
                165                 170                 175

Leu Thr Asn Phe Ser Ile Pro Pro Gln Glu Glu Glu Glu Glu Glu Glu
            180                 185                 190

Pro Glu Pro Val Ile Glu Glu Lys Pro Val Ile Met Thr Thr Pro Thr
        195                 200                 205

Pro Thr Thr Ser Ser Ser Glu Ser Thr Glu Glu Asp Leu Gln His Leu
    210                 215                 220

Ser Ser Pro Thr Ser Val Leu Asn His Arg Ser Glu Glu Ile Gln Gln
225                 230                 235                 240

Val Gln Gln Pro Phe Lys Ser Ala Lys Pro Glu Pro Gly Val Ser Asn
                245                 250                 255

Ala Pro Trp Trp His Thr Gly Phe Asn Thr Gly Leu Gly Glu Ser Asp
            260                 265                 270

Asp Ser Phe Pro Leu Asp Thr Pro Phe Leu Asp Asn Tyr Phe Asn Glu
        275                 280                 285

Ser Pro Pro Glu Met Ser Ile Phe Asp Gln Pro Met Asp Gln Ile Phe
    290                 295                 300

Cys Glu Asn Asp Asp Ile Phe Asn Asp Met Leu Phe Leu Gly Gly Glu
305                 310                 315                 320

Thr Met Asn Ile Glu Asp Glu Leu Thr Ser Ser Ser Ile Lys Asp Met
                325                 330                 335

Gly Ser Thr Phe Ser Asp Phe Asp Asp Ser Leu Ile Ser Asp Leu Leu
            340                 345                 350
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Val Ala

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<222> (1)..(1374) <223> G550

<400> 301

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1               5                   10                  15

gag ctt ggt gtt gtt gat tct tct tct agc tat acc gga ttt tta acc       96
Glu Leu Gly Val Val Asp Ser Ser Ser Ser Tyr Thr Gly Phe Leu Thr
            20                  25                  30

gaa act cag att cct gtt cgg tta tca gat tcg tgt acc ggc gat gat      144
Glu Thr Gln Ile Pro Val Arg Leu Ser Asp Ser Cys Thr Gly Asp Asp
        35                  40                  45

gat gat gaa gag atg ggt gat tcc ggt tta gga cga gaa gaa ggt gat      192
Asp Asp Glu Glu Met Gly Asp Ser Gly Leu Gly Arg Glu Glu Gly Asp
    50                  55                  60

gat gtt ggt gat ggt gga gga gag agc gag act gat aaa aag gaa gaa      240
Asp Val Gly Asp Gly Gly Gly Glu Ser Glu Thr Asp Lys Lys Glu Glu
65                  70                  75                  80

aaa gat agt gag tgt cag gaa gag tca ttg agg aat gaa tct aat gat      288
Lys Asp Ser Glu Cys Gln Glu Glu Ser Leu Arg Asn Glu Ser Asn Asp
                85                  90                  95

gtt act act act aca tcg ggt ata act gaa aaa acg gaa aca aca aaa      336
Val Thr Thr Thr Thr Ser Gly Ile Thr Glu Lys Thr Glu Thr Thr Lys
            100                 105                 110

gct gca aag acg aat gaa gag tca ggt ggt act gct tgc tct caa gag      384
Ala Ala Lys Thr Asn Glu Glu Ser Gly Gly Thr Ala Cys Ser Gln Glu
        115                 120                 125

ggg aag tta aag aaa cct gat aag att cta ccg tgt ccg cga tgt aac      432
Gly Lys Leu Lys Lys Pro Asp Lys Ile Leu Pro Cys Pro Arg Cys Asn
    130                 135                 140

agc atg gaa acc aag ttc tgt tac tac aac aac tat aat gtt aac caa      480
Ser Met Glu Thr Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln
145                 150                 155                 160

cct cgc cat ttc tgc aag aaa tgt cag aga tat tgg aca gct ggt gga      528
Pro Arg His Phe Cys Lys Lys Cys Gln Arg Tyr Trp Thr Ala Gly Gly
                165                 170                 175

acg atg agg aat gtt ccg gtt ggt gct ggg aga cgt aag aat aag agt      576
Thr Met Arg Asn Val Pro Val Gly Ala Gly Arg Arg Lys Asn Lys Ser
            180                 185                 190
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cca gct tct cat tat aac cgt cat gta agt ata aca tct gcg gaa gct      624
Pro Ala Ser His Tyr Asn Arg His Val Ser Ile Thr Ser Ala Glu Ala
        195                 200                 205

atg cag aag gtg gcg aga act gat ctt caa cat cct aat ggt gca aat      672
Met Gln Lys Val Ala Arg Thr Asp Leu Gln His Pro Asn Gly Ala Asn
    210                 215                 220

ctt ctc act ttt ggc tct gat tct gtg ctt tgt gaa tct atg gct tct      720
Leu Leu Thr Phe Gly Ser Asp Ser Val Leu Cys Glu Ser Met Ala Ser
225                 230                 235                 240

gga ttg aat ctt gtt gag aag tca ttg ttg aag aca caa act gta ttg      768
Gly Leu Asn Leu Val Glu Lys Ser Leu Leu Lys Thr Gln Thr Val Leu
                245                 250                 255

caa gaa ccc aat gaa ggc ttg aag att acg gtt ccg tta aac cag aca      816
Gln Glu Pro Asn Glu Gly Leu Lys Ile Thr Val Pro Leu Asn Gln Thr
            260                 265                 270

aac gaa gaa gct gga aca gtc agc ccg tta cca aaa gtt cca tgc ttt      864
Asn Glu Glu Ala Gly Thr Val Ser Pro Leu Pro Lys Val Pro Cys Phe
        275                 280                 285

cca gga cca cca cca act tgg cct tac gct tgg aac gga gtt tcg tgg      912
Pro Gly Pro Pro Pro Thr Trp Pro Tyr Ala Trp Asn Gly Val Ser Trp
    290                 295                 300

acg att tta ccg ttt tac cct cca ccg gct tac tgg agc tgc ccg ggg      960
Thr Ile Leu Pro Phe Tyr Pro Pro Pro Ala Tyr Trp Ser Cys Pro Gly
305                 310                 315                 320

gtt tca ccg ggg gca tgg aac agc ttc aca tgg atg cca caa ccc aat     1008
Val Ser Pro Gly Ala Trp Asn Ser Phe Thr Trp Met Pro Gln Pro Asn
                325                 330                 335

tca cca tct ggt tcc aat cca aat tct cct aca cta ggt aaa cat tca     1056
Ser Pro Ser Gly Ser Asn Pro Asn Ser Pro Thr Leu Gly Lys His Ser
            340                 345                 350

cgt gac gag aac gct gct gaa cca gga acc gct ttt gat gaa acc gag     1104
Arg Asp Glu Asn Ala Ala Glu Pro Gly Thr Ala Phe Asp Glu Thr Glu
        355                 360                 365

tca ctt ggt agg gag aaa agc aaa ccc gag aga tgc ttg tgg gtt ccc     1152
Ser Leu Gly Arg Glu Lys Ser Lys Pro Glu Arg Cys Leu Trp Val Pro
    370                 375                 380

aag acg ctg agg att gat gat cca gag gaa gct gct aaa agt tcc atc     1200
Lys Thr Leu Arg Ile Asp Asp Pro Glu Glu Ala Ala Lys Ser Ser Ile
385                 390                 395                 400

tgg gaa aca tta ggg atc aaa aaa gac gaa aat gcg gat act ttc gga     1248
Trp Glu Thr Leu Gly Ile Lys Lys Asp Glu Asn Ala Asp Thr Phe Gly
                405                 410                 415
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09354605 - 062204

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gct ttc aga tca tca acc aaa gaa aaa agc agt ctt tct gaa gga aga     1296
Ala Phe Arg Ser Ser Thr Lys Glu Lys Ser Ser Leu Ser Glu Gly Arg
            420                 425                 430

ctt ccg gga aga aga ccg gag ttg caa gcg aat cct gct gct ctt tct     1344
Leu Pro Gly Arg Arg Pro Glu Leu Gln Ala Asn Pro Ala Ala Leu Ser
        435                 440                 445

agg tca gca aac ttc cat gag agc tca tag                             1374
Arg Ser Ala Asn Phe His Glu Ser Ser
    450                 455
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Glu Leu Gly Val Val Asp Ser Ser Ser Ser Tyr Thr Gly Phe Leu Thr
            20                  25                  30

Glu Thr Gln Ile Pro Val Arg Leu Ser Asp Ser Cys Thr Gly Asp Asp
        35                  40                  45

Asp Asp Glu Glu Met Gly Asp Ser Gly Leu Gly Arg Glu Glu Gly Asp
    50                  55                  60

Asp Val Gly Asp Gly Gly Gly Glu Ser Glu Thr Asp Lys Lys Glu Glu
65                  70                  75                  80

Lys Asp Ser Glu Cys Gln Glu Glu Ser Leu Arg Asn Glu Ser Asn Asp
                85                  90                  95

Val Thr Thr Thr Thr Ser Gly Ile Thr Glu Lys Thr Glu Thr Thr Lys
            100                 105                 110

Ala Ala Lys Thr Asn Glu Glu Ser Gly Gly Thr Ala Cys Ser Gln Glu
        115                 120                 125

Gly Lys Leu Lys Lys Pro Asp Lys Ile Leu Pro Cys Pro Arg Cys Asn
    130                 135                 140

Ser Met Glu Thr Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln
145                 150                 155                 160

Pro Arg His Phe Cys Lys Lys Cys Gln Arg Tyr Trp Thr Ala Gly Gly
                165                 170                 175
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```
Thr Met Arg Asn Val Pro Val Gly Ala Gly Arg Arg Lys Asn Lys Ser
            180                 185                 190

Pro Ala Ser His Tyr Asn Arg His Val Ser Ile Thr Ser Ala Glu Ala
        195                 200                 205

Met Gln Lys Val Ala Arg Thr Asp Leu Gln His Pro Asn Gly Ala Asn
    210                 215                 220

Leu Leu Thr Phe Gly Ser Asp Ser Val Leu Cys Glu Ser Met Ala Ser
225                 230                 235                 240

Gly Leu Asn Leu Val Glu Lys Ser Leu Leu Lys Thr Gln Thr Val Leu
                245                 250                 255

Gln Glu Pro Asn Glu Gly Leu Lys Ile Thr Val Pro Leu Asn Gln Thr
            260                 265                 270

Asn Glu Glu Ala Gly Thr Val Ser Pro Leu Pro Lys Val Pro Cys Phe
        275                 280                 285

Pro Gly Pro Pro Pro Thr Trp Pro Tyr Ala Trp Asn Gly Val Ser Trp
    290                 295                 300

Thr Ile Leu Pro Phe Tyr Pro Pro Pro Ala Tyr Trp Ser Cys Pro Gly
305                 310                 315                 320

Val Ser Pro Gly Ala Trp Asn Ser Phe Thr Trp Met Pro Gln Pro Asn
                325                 330                 335

Ser Pro Ser Gly Ser Asn Pro Asn Ser Pro Thr Leu Gly Lys His Ser
            340                 345                 350

Arg Asp Glu Asn Ala Ala Glu Pro Gly Thr Ala Phe Asp Glu Thr Glu
        355                 360                 365

Ser Leu Gly Arg Glu Lys Ser Lys Pro Glu Arg Cys Leu Trp Val Pro
    370                 375                 380

Lys Thr Leu Arg Ile Asp Asp Pro Glu Glu Ala Ala Lys Ser Ser Ile
385                 390                 395                 400
```

```
Trp Glu Thr Leu Gly Ile Lys Lys Asp Glu Asn Ala Asp Thr Phe Gly
                405                 410                 415

Ala Phe Arg Ser Ser Thr Lys Glu Lys Ser Ser Leu Ser Glu Gly Arg
            420                 425                 430

Leu Pro Gly Arg Arg Pro Glu Leu Gln Ala Asn Pro Ala Ala Leu Ser
        435                 440                 445

Arg Ser Ala Asn Phe His Glu Ser Ser
    450                 455
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                               Met Gly Arg His Ser Cys Cys Tyr Lys
                               1               5

caa aag ctg agg aaa ggg ctt tgg tct cct gaa gaa gac gag aag ctt      102
Gln Lys Leu Arg Lys Gly Leu Trp Ser Pro Glu Glu Asp Glu Lys Leu
10                  15                  20                  25

ctt act cac atc acc aat cac ggc cat ggc tgc tgg agc tct gtc cct      150
Leu Thr His Ile Thr Asn His Gly His Gly Cys Trp Ser Ser Val Pro
                30                  35                  40

aaa ctc gct ggt ttg cag aga tgt ggg aag agt tgt cga ctc gag cag      198
Lys Leu Ala Gly Leu Gln Arg Cys Gly Lys Ser Cys Arg Leu Glu Gln
            45                  50                  55

atc tgg tac cgc cga cta aga tgg atc aat tac ttg aga cct gat tta      246
Ile Trp Tyr Arg Arg Leu Arg Trp Ile Asn Tyr Leu Arg Pro Asp Leu
        60                  65                  70

aag aga gga gct ttt tct cct gaa gaa gag aat ctc atc gtc gaa ctt      294
Lys Arg Gly Ala Phe Ser Pro Glu Glu Glu Asn Leu Ile Val Glu Leu
    75                  80                  85

cat gcc gtc ctt gga aac aga tgg tca cag att gcg tca agg ctt ccg      342
His Ala Val Leu Gly Asn Arg Trp Ser Gln Ile Ala Ser Arg Leu Pro
90                  95                  100                 105

ggt aga acc gac aac gag atc aag aat cta tgg aac tca agc atc aag      390
Gly Arg Thr Asp Asn Glu Ile Lys Asn Leu Trp Asn Ser Ser Ile Lys
                110                 115                 120

aag aaa ctg aaa caa aga ggc att gac cca aac aca cac aag ccc atc      438
Lys Lys Leu Lys Gln Arg Gly Ile Asp Pro Asn Thr His Lys Pro Ile
            125                 130                 135
```

```
tct gaa gtg gag agt ttt agc gac aaa gac aaa cca aca aca agc aac      486
Ser Glu Val Glu Ser Phe Ser Asp Lys Asp Lys Pro Thr Thr Ser Asn
        140                 145                 150

aac aaa aga agc ggt aac gat cac aag tct cct agt tcc tct tct gcg      534
Asn Lys Arg Ser Gly Asn Asp His Lys Ser Pro Ser Ser Ser Ser Ala
    155                 160                 165

act aac caa gac ttc ttc ctc gaa agg cca tct gat tta tcc gac tac      582
Thr Asn Gln Asp Phe Phe Leu Glu Arg Pro Ser Asp Leu Ser Asp Tyr
170                 175                 180                 185

ttc gga ttt cag aag ctt aac ttc aac tcc aat cta gga ctc tct gtt      630
Phe Gly Phe Gln Lys Leu Asn Phe Asn Ser Asn Leu Gly Leu Ser Val
                190                 195                 200

aca act gat tct tca ctc tgc tcg atg att ccg ccg cag ttt agc ccc      678
Thr Thr Asp Ser Ser Leu Cys Ser Met Ile Pro Pro Gln Phe Ser Pro
            205                 210                 215

ggg aac atg gtt ggt tct gtc ctt cag aca cca gta tgc gta aag ccc      726
Gly Asn Met Val Gly Ser Val Leu Gln Thr Pro Val Cys Val Lys Pro
        220                 225                 230

tcg att agt ctt cct ccc gac aac aac agt tcg agt cct atc tcc gga      774
Ser Ile Ser Leu Pro Pro Asp Asn Asn Ser Ser Ser Pro Ile Ser Gly
    235                 240                 245

gga gat cat gtg aaa ttg gct gca cca aac tgg gaa ttt cag aca aac      822
Gly Asp His Val Lys Leu Ala Ala Pro Asn Trp Glu Phe Gln Thr Asn
250                 255                 260                 265

aac aat aat acc tca aat ttc ttc gac aat ggc gga ttc tca tgg tct      870
Asn Asn Asn Thr Ser Asn Phe Phe Asp Asn Gly Gly Phe Ser Trp Ser
                270                 275                 280

atc cca aat tct tct act tct tct tca caa gtc aaa cca aat cat aac      918
Ile Pro Asn Ser Ser Thr Ser Ser Ser Gln Val Lys Pro Asn His Asn
            285                 290                 295

ttc gaa gaa ata aaa tgg tca gag tat ttg aac aca ccg ttc ttc ata      966
Phe Glu Glu Ile Lys Trp Ser Glu Tyr Leu Asn Thr Pro Phe Phe Ile
        300                 305                 310

ggg agt act gta cag agt caa acc tct caa cca atc tac atc aaa tca     1014
Gly Ser Thr Val Gln Ser Gln Thr Ser Gln Pro Ile Tyr Ile Lys Ser
    315                 320                 325

gaa aca gat tac tta gcc aat gtt tca aac atg aca gat cct tgg agc     1062
Glu Thr Asp Tyr Leu Ala Asn Val Ser Asn Met Thr Asp Pro Trp Ser
330                 335                 340                 345

caa aac gag aac ttg ggc aca act gaa act agt gac gtg ttc tcc aag     1110
Gln Asn Glu Asn Leu Gly Thr Thr Glu Thr Ser Asp Val Phe Ser Lys
                350                 355                 360

gat ctt cag aga atg gcc gtc tct ttt ggt cag tcc ctt tag             1152
```

Asp Leu Gln Arg Met Ala Val Ser Phe Gly Gln Ser Leu
365 370

ctttttttctt tctttctttc ttatttctaa cagatgtaga gaacataaag atatacaaat 1212

acatacaatg tcaatacgta cagtggattt aagtgttctg tatatttcat gggcgagctg 1272

tctttatttt tatgtttaaa aaaaaaaaaa aaaaa 1307

<210> 304 <211> 374 <212> PRT <213> Arabidopsis thaliana <400> 304

Met Gly Arg His Ser Cys Cys Tyr Lys Gln Lys Leu Arg Lys Gly Leu
1 5 10 15

Trp Ser Pro Glu Glu Asp Glu Lys Leu Leu Thr His Ile Thr Asn His
20 25 30

Gly His Gly Cys Trp Ser Ser Val Pro Lys Leu Ala Gly Leu Gln Arg
35 40 45

Cys Gly Lys Ser Cys Arg Leu Glu Gln Ile Trp Tyr Arg Arg Leu Arg
50 55 60

Trp Ile Asn Tyr Leu Arg Pro Asp Leu Lys Arg Gly Ala Phe Ser Pro
65 70 75 80

Glu Glu Glu Asn Leu Ile Val Glu Leu His Ala Val Leu Gly Asn Arg
85 90 95

Trp Ser Gln Ile Ala Ser Arg Leu Pro Gly Arg Thr Asp Asn Glu Ile
100 105 110

Lys Asn Leu Trp Asn Ser Ser Ile Lys Lys Lys Leu Lys Gln Arg Gly
115 120 125

Ile Asp Pro Asn Thr His Lys Pro Ile Ser Glu Val Glu Ser Phe Ser
130 135 140

Asp Lys Asp Lys Pro Thr Thr Ser Asn Asn Lys Arg Ser Gly Asn Asp
145 150 155 160

His Lys Ser Pro Ser Ser Ser Ser Ala Thr Asn Gln Asp Phe Phe Leu
165 170 175

Glu Arg Pro Ser Asp Leu Ser Asp Tyr Phe Gly Phe Gln Lys Leu Asn

180 185 190

Phe Asn Ser Asn Leu Gly Leu Ser Val Thr Thr Asp Ser Ser Leu Cys
195 200 205

Ser Met Ile Pro Pro Gln Phe Ser Pro Gly Asn Met Val Gly Ser Val
210 215 220

Leu Gln Thr Pro Val Cys Val Lys Pro Ser Ile Ser Leu Pro Pro Asp
225 230 235 240

Asn Asn Ser Ser Ser Pro Ile Ser Gly Gly Asp His Val Lys Leu Ala
245 250 255

Ala Pro Asn Trp Glu Phe Gln Thr Asn Asn Asn Asn Thr Ser Asn Phe
260 265 270

Phe Asp Asn Gly Gly Phe Ser Trp Ser Ile Pro Asn Ser Ser Thr Ser
275 280 285

Ser Ser Gln Val Lys Pro Asn His Asn Phe Glu Glu Ile Lys Trp Ser
290 295 300

Glu Tyr Leu Asn Thr Pro Phe Phe Ile Gly Ser Thr Val Gln Ser Gln
305 310 315 320

Thr Ser Gln Pro Ile Tyr Ile Lys Ser Glu Thr Asp Tyr Leu Ala Asn
325 330 335

Val Ser Asn Met Thr Asp Pro Trp Ser Gln Asn Glu Asn Leu Gly Thr
340 345 350

Thr Glu Thr Ser Asp Val Phe Ser Lys Asp Leu Gln Arg Met Ala Val
355 360 365

Ser Phe Gly Gln Ser Leu
370

<210> 305 <211> 1747 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (503)..(1534) <223> G864

<400> 305
tgcaaaaaca ttttcttgtc tctcctctgc ccaaattttt tttctttcca ggaatatttc 60

Substitute Sheet (Rule 26)

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ctagaaaaac ccaagcaaag ctttaacccc ttcctcctcc aaaagtagca tcttcctctt    120

tttctatttc tcctttcctc ttcttatctc tctctcgttt gtgaacgatt ccttaagaat    180

ataaccaaaa gccctttttct cctttcttca actttccggg aaaaatcttc acgcagcaag    240

gtttctctct cggctctcgc agtgtttttc gggccttttg ttctttctat aaaaaaaaaa    300

ttcgcgtcct ttaagaaaac tttttccacc tagagaagaa gaagagtatc actcttgttg    360

ttcaagtttc tctctttaat aaaaaatcca tctttattct ttgtcttctt tccttttttgc    420

tttccctaat ctctatgtta taaacacaca gagagaaaca aagtcacagt ctcgagtcaa    480

aaacagagaa tacgaaagaa aa atg gaa gcg gag aag aaa atg gtt cta ccg      532
                         Met Glu Ala Glu Lys Lys Met Val Leu Pro
                         1               5                   10

aga atc aaa ttc aca gag cac aaa acc aac acg aca aca atc gta tcg      580
Arg Ile Lys Phe Thr Glu His Lys Thr Asn Thr Thr Thr Ile Val Ser
                15                  20                  25

gag tta acc aac act cac caa acc agg att ctt cgt atc tca gtc act      628
Glu Leu Thr Asn Thr His Gln Thr Arg Ile Leu Arg Ile Ser Val Thr
            30                  35                  40

gac cca gac gct act gat tcc tcc agt gac gac gaa gaa gaa gaa cat      676
Asp Pro Asp Ala Thr Asp Ser Ser Ser Asp Asp Glu Glu Glu Glu His
        45                  50                  55

caa cgc ttt gtc tct aaa cgc cgt cgt gtt aag aag ttt gtc aac gaa      724
Gln Arg Phe Val Ser Lys Arg Arg Arg Val Lys Lys Phe Val Asn Glu
    60                  65                  70

gtc tat ctc gat tcc ggt gct gtt gtt act ggt agt tgt ggt caa atg      772
Val Tyr Leu Asp Ser Gly Ala Val Val Thr Gly Ser Cys Gly Gln Met
75                  80                  85                  90

gag tcg aag aag aga caa aag aga gcg gtt aaa tcg gag tct act gtt      820
Glu Ser Lys Lys Arg Gln Lys Arg Ala Val Lys Ser Glu Ser Thr Val
                95                  100                 105

tct ccg gtt gtt tca gcg acg acg act acg acg gga gag aag aag ttc      868
Ser Pro Val Val Ser Ala Thr Thr Thr Thr Thr Gly Glu Lys Lys Phe
            110                 115                 120

cga gga gtg aga cag cgt cca tgg gga aaa tgg gcg gcg gag ata aga      916
Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg
        125                 130                 135

gat ccg ttg aaa cgt gta cgg ctc tgg tta ggt act tac aac acg gcg      964
Asp Pro Leu Lys Arg Val Arg Leu Trp Leu Gly Thr Tyr Asn Thr Ala
    140                 145                 150

gaa gaa gct gct atg gtt tac gat aac gcc gct att cag ctt cgt ggt     1012
Glu Glu Ala Ala Met Val Tyr Asp Asn Ala Ala Ile Gln Leu Arg Gly
155                 160                 165                 170
```

ccc gac gct ctg act aat ttc tca gtc act ccg aca aca gcg acg gag 1060
Pro Asp Ala Leu Thr Asn Phe Ser Val Thr Pro Thr Thr Ala Thr Glu
175 180 185

aag aaa gcc cca cca ccg tct ccg gtg aag aag aag aag aag aaa aac 1108
Lys Lys Ala Pro Pro Pro Ser Pro Val Lys Lys Lys Lys Lys Lys Asn
190 195 200

aac aaa agc aaa aaa tcc gtt act gct tct tcc tcc atc agc aga agc 1156
Asn Lys Ser Lys Lys Ser Val Thr Ala Ser Ser Ser Ile Ser Arg Ser
205 210 215

agc agc aac gat tgt ctc tgc tct ccg gtg tct gtt ctc cga tct cct 1204
Ser Ser Asn Asp Cys Leu Cys Ser Pro Val Ser Val Leu Arg Ser Pro
220 225 230

ttc gcc gtc gac gaa ttc tcc ggc att tct tca tca cca gtc gcg gcc 1252
Phe Ala Val Asp Glu Phe Ser Gly Ile Ser Ser Ser Pro Val Ala Ala
235 240 245 250

gtt gta gtc aag gaa gag cca tcc atg aca acg gta tct gaa act ttc 1300
Val Val Val Lys Glu Glu Pro Ser Met Thr Thr Val Ser Glu Thr Phe
255 260 265

tct gat ttc tcg gcg ccc ttg ttc tca gat gat gac gtg ttc gat ttc 1348
Ser Asp Phe Ser Ala Pro Leu Phe Ser Asp Asp Asp Val Phe Asp Phe
270 275 280

cgg agc tca gtg gtt ccc gac tat ctc ggc ggc gat tta ttt ggg gaa 1396
Arg Ser Ser Val Val Pro Asp Tyr Leu Gly Gly Asp Leu Phe Gly Glu
285 290 295

gat cta ttc acg gcg gat atg tgt acg gat atg aac ttc gga ttc gat 1444
Asp Leu Phe Thr Ala Asp Met Cys Thr Asp Met Asn Phe Gly Phe Asp
300 305 310

ttc gga tcc gga tta tcc agc tgg cac atg gag gac cat ttt caa gat 1492
Phe Gly Ser Gly Leu Ser Ser Trp His Met Glu Asp His Phe Gln Asp
315 320 325 330

atc ggg gat cta ttc ggg tcg gat cct ctt tta gct gtt taa 1534
Ile Gly Asp Leu Phe Gly Ser Asp Pro Leu Leu Ala Val
335 340

taatatttta aataaataaa tagttatacc ggccgttact aaacggaacc ggagaaagtt 1594

ttgtataccg gtgacataaa atctcggtta tgttcgtaat ctttttttct ttgttatata 1654

taaaaatatg aatgaaactg aattaatgta agttaatggt gataattatt aacgttttaa 1714

gttttgaaaa aaaaaaaaaa aaaaaaaaaa aaa 1747

<210> 306 <211> 343 <212> PRT <213> Arabidopsis thaliana <400> 306

Met Glu Ala Glu Lys Lys Met Val Leu Pro Arg Ile Lys Phe Thr Glu

Substitute Sheet (Rule 26)

1 5 10 15

His Lys Thr Asn Thr Thr Thr Ile Val Ser Glu Leu Thr Asn Thr His
20 25 30

Gln Thr Arg Ile Leu Arg Ile Ser Val Thr Asp Pro Asp Ala Thr Asp
35 40 45

Ser Ser Ser Asp Asp Glu Glu Glu Glu His Gln Arg Phe Val Ser Lys
50 55 60

Arg Arg Arg Val Lys Lys Phe Val Asn Glu Val Tyr Leu Asp Ser Gly
65 70 75 80

Ala Val Val Thr Gly Ser Cys Gly Gln Met Glu Ser Lys Lys Arg Gln
85 90 95

Lys Arg Ala Val Lys Ser Glu Ser Thr Val Ser Pro Val Val Ser Ala
100 105 110

Thr Thr Thr Thr Thr Gly Glu Lys Lys Phe Arg Gly Val Arg Gln Arg
115 120 125

Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg Asp Pro Leu Lys Arg Val
130 135 140

Arg Leu Trp Leu Gly Thr Tyr Asn Thr Ala Glu Glu Ala Ala Met Val
145 150 155 160

Tyr Asp Asn Ala Ala Ile Gln Leu Arg Gly Pro Asp Ala Leu Thr Asn
165 170 175

Phe Ser Val Thr Pro Thr Thr Ala Thr Glu Lys Lys Ala Pro Pro Pro
180 185 190

Ser Pro Val Lys Lys Lys Lys Lys Lys Asn Asn Lys Ser Lys Lys Ser
195 200 205

Val Thr Ala Ser Ser Ser Ile Ser Arg Ser Ser Ser Asn Asp Cys Leu
210 215 220

Cys Ser Pro Val Ser Val Leu Arg Ser Pro Phe Ala Val Asp Glu Phe
225 230 235 240

Ser Gly Ile Ser Ser Ser Pro Val Ala Ala Val Val Val Lys Glu Glu
245 250 255

Pro Ser Met Thr Thr Val Ser Glu Thr Phe Ser Asp Phe Ser Ala Pro
260 265 270

Leu Phe Ser Asp Asp Asp Val Phe Asp Phe Arg Ser Ser Val Val Pro
275 280 285

Asp Tyr Leu Gly Gly Asp Leu Phe Gly Glu Asp Leu Phe Thr Ala Asp
290 295 300

Met Cys Thr Asp Met Asn Phe Gly Phe Asp Phe Gly Ser Gly Leu Ser
305 310 315 320

Ser Trp His Met Glu Asp His Phe Gln Asp Ile Gly Asp Leu Phe Gly
325 330 335

Ser Asp Pro Leu Leu Ala Val
340

<210> 307 <211> 1652 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (63)..(1538) <223> G960

<400> 307
taccgtcgac ccacgcgtcc gagtgtattc aaagtcggaa agaaacccta aagaagagga 60

tt atg ggt gct gta tcg atg gag tcg ctt cct tta ggt ttc aga ttc 107
Met Gly Ala Val Ser Met Glu Ser Leu Pro Leu Gly Phe Arg Phe
1 5 10 15

aga cct acc gat gaa gag ctc gtc aat cac tac ctc cgt ctc aag atc 155
Arg Pro Thr Asp Glu Glu Leu Val Asn His Tyr Leu Arg Leu Lys Ile
20 25 30

aac gga cgt cac tcc gat gtc cgt gtc atc cct gat atc gat gtc tgc 203
Asn Gly Arg His Ser Asp Val Arg Val Ile Pro Asp Ile Asp Val Cys
35 40 45

aaa tgg gaa cct tgg gat ctt cct gct ctc tcg gtg att aag acg gat 251
Lys Trp Glu Pro Trp Asp Leu Pro Ala Leu Ser Val Ile Lys Thr Asp
50 55 60

gat cca gag tgg ttc ttt ttc tgc cct cgt gat cgg aaa tac cct aat 299
Asp Pro Glu Trp Phe Phe Phe Cys Pro Arg Asp Arg Lys Tyr Pro Asn
65 70 75

ggt cat cgc tct aac aga gca act gac tct ggc tat tgg aaa gct act 347

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Gly His Arg Ser Asn Arg Ala Thr Asp Ser Gly Tyr Trp Lys Ala Thr
80                  85                  90                  95

ggt aaa gat cgt agc atc aag tct aag aag act tta atc ggt atg aag      395
Gly Lys Asp Arg Ser Ile Lys Ser Lys Lys Thr Leu Ile Gly Met Lys
                100                 105                 110

aag act ctt gtc ttc tat cgt gga cga gct cct aaa ggt gag cgg act      443
Lys Thr Leu Val Phe Tyr Arg Gly Arg Ala Pro Lys Gly Glu Arg Thr
            115                 120                 125

aat tgg att atg cac gag tat cgt ccc act ctt aag gat ctt gat ggc      491
Asn Trp Ile Met His Glu Tyr Arg Pro Thr Leu Lys Asp Leu Asp Gly
        130                 135                 140

act tcc cct ggc caa agc cct tac gtt ctt tgt cgc ctc ttc cac aag      539
Thr Ser Pro Gly Gln Ser Pro Tyr Val Leu Cys Arg Leu Phe His Lys
    145                 150                 155

cct gat gat cgg gtt aat ggt gtc aag tcc gat gaa gca gct ttt acg      587
Pro Asp Asp Arg Val Asn Gly Val Lys Ser Asp Glu Ala Ala Phe Thr
160                 165                 170                 175

gcc agc aac aaa tac tca cct gat gat aca tca tct gat ctt gtt caa      635
Ala Ser Asn Lys Tyr Ser Pro Asp Asp Thr Ser Ser Asp Leu Val Gln
                180                 185                 190

gaa aca cct tcc tct gat gct gct gtt gag aaa cca tca gat tat tca      683
Glu Thr Pro Ser Ser Asp Ala Ala Val Glu Lys Pro Ser Asp Tyr Ser
            195                 200                 205

ggt gga tgc ggt tat gct cat agt aat agt acc gca gat ggg aca atg      731
Gly Gly Cys Gly Tyr Ala His Ser Asn Ser Thr Ala Asp Gly Thr Met
        210                 215                 220

att gag gca cct gaa gag aat ctt tgg tta tct tgt gac ctt gaa gat      779
Ile Glu Ala Pro Glu Glu Asn Leu Trp Leu Ser Cys Asp Leu Glu Asp
    225                 230                 235

caa aag gca cca cta ccg tgt atg gat tct ata tat gct ggt gat ttc      827
Gln Lys Ala Pro Leu Pro Cys Met Asp Ser Ile Tyr Ala Gly Asp Phe
240                 245                 250                 255

agt tac gat gag att gga ttc caa ttt caa gat ggt acc agc gaa cca      875
Ser Tyr Asp Glu Ile Gly Phe Gln Phe Gln Asp Gly Thr Ser Glu Pro
                260                 265                 270

gat gta tca cta aca gaa ttg ttg gag gag gtg ttc aat aac cct gat      923
Asp Val Ser Leu Thr Glu Leu Leu Glu Glu Val Phe Asn Asn Pro Asp
            275                 280                 285

gac ttc tct tgc gag gaa tcg atc agt cga gag aat cca gca gtc tca      971
Asp Phe Ser Cys Glu Glu Ser Ile Ser Arg Glu Asn Pro Ala Val Ser
        290                 295                 300

cca aat ggg ata ttt tca tct gct aaa atg ctg cag tct gca gca cca     1019
Pro Asn Gly Ile Phe Ser Ser Ala Lys Met Leu Gln Ser Ala Ala Pro
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     305                 310                 315

gag gat gct ttc ttc aac gac ttc atg gct ttc act gat aca gat gct     1067
Glu Asp Ala Phe Phe Asn Asp Phe Met Ala Phe Thr Asp Thr Asp Ala
320                 325                 330                 335

gag atg gcg caa ttg cag tat ggt tca gaa ggt gga gct tct ggt tgg     1115
Glu Met Ala Gln Leu Gln Tyr Gly Ser Glu Gly Gly Ala Ser Gly Trp
                340                 345                 350

cca agt gac act aat tca tac tat agt gat ttg gtt cag caa gag caa     1163
Pro Ser Asp Thr Asn Ser Tyr Tyr Ser Asp Leu Val Gln Gln Glu Gln
            355                 360                 365

atg atc aat cat aac aca gag aac aac ctc aca gaa ggg aga ggg ata     1211
Met Ile Asn His Asn Thr Glu Asn Asn Leu Thr Glu Gly Arg Gly Ile
        370                 375                 380

aag atc cgg gct cga cag cct cag aac cgg cag agt aca gga ttg ata     1259
Lys Ile Arg Ala Arg Gln Pro Gln Asn Arg Gln Ser Thr Gly Leu Ile
    385                 390                 395

aac cag ggt att gct cca agg aga atc cgt ctg cag ctg cag tct aac     1307
Asn Gln Gly Ile Ala Pro Arg Arg Ile Arg Leu Gln Leu Gln Ser Asn
400                 405                 410                 415

tct gaa gta aaa gaa cga gag gag gtg aat gaa gga cac act gtt att     1355
Ser Glu Val Lys Glu Arg Glu Glu Val Asn Glu Gly His Thr Val Ile
                420                 425                 430

ccc gag gcc aaa gaa gct gca gct aaa tac tca gag aag agt ggt tct     1403
Pro Glu Ala Lys Glu Ala Ala Ala Lys Tyr Ser Glu Lys Ser Gly Ser
            435                 440                 445

ttg gtt aaa cct caa ata aag ctc agg gcg cgg gga act ata ggc caa     1451
Leu Val Lys Pro Gln Ile Lys Leu Arg Ala Arg Gly Thr Ile Gly Gln
        450                 455                 460

gta aaa gga gag aga ttt gca gac gac gag gta cag gtg cag agc aca     1499
Val Lys Gly Glu Arg Phe Ala Asp Asp Glu Val Gln Val Gln Ser Thr
    465                 470                 475

aag aga gag aga gag aga atc aaa tgt agt tta atg taa ttagggatga     1548
Lys Arg Glu Arg Glu Arg Ile Lys Cys Ser Leu Met
480                 485                 490

tgcaatgtta gcatgtttgt gtgttgtaac ttaaaaactt atttaggaat ctgataaaag   1608

ttactgttga aaaaagaaaa aaaaaaaaaa aaaaaaaaaa aaaa                    1652


<210>  308 <211>  491 <212>  PRT <213>  Arabidopsis thaliana  <400>  308

Met Gly Ala Val Ser Met Glu Ser Leu Pro Leu Gly Phe Arg Phe Arg
1               5                   10                  15
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Pro Thr Asp Glu Glu Leu Val Asn His Tyr Leu Arg Leu Lys Ile Asn
20 25 30

Gly Arg His Ser Asp Val Arg Val Ile Pro Asp Ile Asp Val Cys Lys
35 40 45

Trp Glu Pro Trp Asp Leu Pro Ala Leu Ser Val Ile Lys Thr Asp Asp
50 55 60

Pro Glu Trp Phe Phe Phe Cys Pro Arg Asp Arg Lys Tyr Pro Asn Gly
65 70 75 80

His Arg Ser Asn Arg Ala Thr Asp Ser Gly Tyr Trp Lys Ala Thr Gly
85 90 95

Lys Asp Arg Ser Ile Lys Ser Lys Lys Thr Leu Ile Gly Met Lys Lys
100 105 110

Thr Leu Val Phe Tyr Arg Gly Arg Ala Pro Lys Gly Glu Arg Thr Asn
115 120 125

Trp Ile Met His Glu Tyr Arg Pro Thr Leu Lys Asp Leu Asp Gly Thr
130 135 140

Ser Pro Gly Gln Ser Pro Tyr Val Leu Cys Arg Leu Phe His Lys Pro
145 150 155 160

Asp Asp Arg Val Asn Gly Val Lys Ser Asp Glu Ala Ala Phe Thr Ala
165 170 175

Ser Asn Lys Tyr Ser Pro Asp Asp Thr Ser Ser Asp Leu Val Gln Glu
180 185 190

Thr Pro Ser Ser Asp Ala Ala Val Glu Lys Pro Ser Asp Tyr Ser Gly
195 200 205

Gly Cys Gly Tyr Ala His Ser Asn Ser Thr Ala Asp Gly Thr Met Ile
210 215 220

Glu Ala Pro Glu Glu Asn Leu Trp Leu Ser Cys Asp Leu Glu Asp Gln
225 230 235 240

Lys Ala Pro Leu Pro Cys Met Asp Ser Ile Tyr Ala Gly Asp Phe Ser

245 250 255

Tyr Asp Glu Ile Gly Phe Gln Phe Gln Asp Gly Thr Ser Glu Pro Asp
260 265 270

Val Ser Leu Thr Glu Leu Leu Glu Glu Val Phe Asn Asn Pro Asp Asp
275 280 285

Phe Ser Cys Glu Glu Ser Ile Ser Arg Glu Asn Pro Ala Val Ser Pro
290 295 300

Asn Gly Ile Phe Ser Ser Ala Lys Met Leu Gln Ser Ala Ala Pro Glu
305 310 315 320

Asp Ala Phe Phe Asn Asp Phe Met Ala Phe Thr Asp Thr Asp Ala Glu
325 330 335

Met Ala Gln Leu Gln Tyr Gly Ser Glu Gly Gly Ala Ser Gly Trp Pro
340 345 350

Ser Asp Thr Asn Ser Tyr Tyr Ser Asp Leu Val Gln Gln Glu Gln Met
355 360 365

Ile Asn His Asn Thr Glu Asn Asn Leu Thr Glu Gly Arg Gly Ile Lys
370 375 380

Ile Arg Ala Arg Gln Pro Gln Asn Arg Gln Ser Thr Gly Leu Ile Asn
385 390 395 400

Gln Gly Ile Ala Pro Arg Arg Ile Arg Leu Gln Leu Gln Ser Asn Ser
405 410 415

Glu Val Lys Glu Arg Glu Glu Val Asn Glu Gly His Thr Val Ile Pro
420 425 430

Glu Ala Lys Glu Ala Ala Ala Lys Tyr Ser Glu Lys Ser Gly Ser Leu
435 440 445

Val Lys Pro Gln Ile Lys Leu Arg Ala Arg Gly Thr Ile Gly Gln Val
450 455 460

Lys Gly Glu Arg Phe Ala Asp Asp Glu Val Gln Val Gln Ser Thr Lys
465 470 475 480

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Arg Glu Arg Glu Arg Ile Lys Cys Ser Leu Met
                485                 490


<210>  309 <211>  1354 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (89)..(973) <223>  G1008

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gccttttga ctcttctttc tctcttctac ttttttttcag gctctctctc tatatctcta     60

tcttcttctc cggttaacta aaagagaa atg aaa agc cga gtg aga aaa tcc       112
                               Met Lys Ser Arg Val Arg Lys Ser
                               1               5

aag tac acg gtt cac cgg aaa atc aca tcc aca ccg ttc gac ggt ttc      160
Lys Tyr Thr Val His Arg Lys Ile Thr Ser Thr Pro Phe Asp Gly Phe
    10                  15                  20

ccg aag att gtc aaa atc ata gtc act gac cca tgc gct act gat tct      208
Pro Lys Ile Val Lys Ile Ile Val Thr Asp Pro Cys Ala Thr Asp Ser
25                  30                  35                  40

tcc agc gat gag gaa aac gac aac aaa tct gtt gct ccg agg gtg aaa      256
Ser Ser Asp Glu Glu Asn Asp Asn Lys Ser Val Ala Pro Arg Val Lys
                45                  50                  55

cgt tat gtg gat gag atc agg ttc tgt gac gaa gat gac gaa cct aaa      304
Arg Tyr Val Asp Glu Ile Arg Phe Cys Asp Glu Asp Asp Glu Pro Lys
            60                  65                  70

ccg gcg agg aaa gcg aag aaa aag tcc ccg gcg gct gcg gcg gag aac      352
Pro Ala Arg Lys Ala Lys Lys Lys Ser Pro Ala Ala Ala Ala Glu Asn
        75                  80                  85

ggt gga gat ttg gta aag tct gtg gtg aag tat aga gga gtg aga caa      400
Gly Gly Asp Leu Val Lys Ser Val Val Lys Tyr Arg Gly Val Arg Gln
    90                  95                  100

cga cct tgg gga aaa ttt gcg gcg gag att cgt gat cct tcg agt cgt      448
Arg Pro Trp Gly Lys Phe Ala Ala Glu Ile Arg Asp Pro Ser Ser Arg
105                 110                 115                 120

act aga ctc tgg ctt ggg act ttt gcg acg gcg gag gaa gct gct ata      496
Thr Arg Leu Trp Leu Gly Thr Phe Ala Thr Ala Glu Glu Ala Ala Ile
                125                 130                 135

ggt tac gat aga gcc gcg att cga atc aaa ggt cat aac gct cag acg      544
Gly Tyr Asp Arg Ala Ala Ile Arg Ile Lys Gly His Asn Ala Gln Thr
            140                 145                 150

aat ttt ctc act cct cct cct agt ccg acg act gag gtg tta ccg gaa      592
Asn Phe Leu Thr Pro Pro Pro Ser Pro Thr Thr Glu Val Leu Pro Glu
        155                 160                 165

act ccg gtg att gac ctt gaa act gtc tct ggt tgt gat tcg gcg agg      640
```

```
Thr Pro Val Ile Asp Leu Glu Thr Val Ser Gly Cys Asp Ser Ala Arg
    170                 175                 180

gaa tcg caa atc agt ctg tgt tct ccg act tct gtt ctc cgg ttt agt      688
Glu Ser Gln Ile Ser Leu Cys Ser Pro Thr Ser Val Leu Arg Phe Ser
185                 190                 195                 200

cac aac gac gaa aca gag tac aga aca gag cca acg gaa gaa caa aat      736
His Asn Asp Glu Thr Glu Tyr Arg Thr Glu Pro Thr Glu Glu Gln Asn
                205                 210                 215

ccg ttt ttc ttg cct gat ttg ttt cgc tcc gga gat tat ttt tgg gat      784
Pro Phe Phe Leu Pro Asp Leu Phe Arg Ser Gly Asp Tyr Phe Trp Asp
            220                 225                 230

tcc gaa att acc cct gac cct ttg ttt ctc gac gaa ttc cac cag tcc      832
Ser Glu Ile Thr Pro Asp Pro Leu Phe Leu Asp Glu Phe His Gln Ser
        235                 240                 245

ttg tta cca aac atc aac aac aac aac aca gtg tgt gat aag gat acg      880
Leu Leu Pro Asn Ile Asn Asn Asn Asn Thr Val Cys Asp Lys Asp Thr
    250                 255                 260

aat ctg tct gat agt ttt ccg ttg gga gtg atc gga gat ttc agc tca      928
Asn Leu Ser Asp Ser Phe Pro Leu Gly Val Ile Gly Asp Phe Ser Ser
265                 270                 275                 280

tgg gat gtt gat gag ttt ttc caa gat cat ttg ttg gat aag taa          973
Trp Asp Val Asp Glu Phe Phe Gln Asp His Leu Leu Asp Lys
                285                 290

tttgatgagt tcttccccag aatttttctg ggtttctctt tttggttgtg tgagtgagat   1033

gagtggtttg atgacaacga cggggatgaa tcttagccgt ccgttttcca tttcgtggac   1093

ggctccgatc agcggaagaa gcgcaacgga gtttttattt atctgtttga gaattttata   1153

atttaatttg cgagtaaata tagtaattag tgttaagatt gtgagagttt aagttaatta   1213

gggaggggtt ttgaatattg gggattttgg gaggtttttg tttggtttct ctccaagtct   1273

gtcactatgc aaggaagcag tataaagacc gtatatatat tttattatta atattgataa   1333

aagtaaaaaa aaaaaaaaaa a                                             1354

<210>  310 <211>  294 <212>  PRT <213>  Arabidopsis thaliana  <400>  310

Met Lys Ser Arg Val Arg Lys Ser Lys Tyr Thr Val His Arg Lys Ile
1               5                   10                  15

Thr Ser Thr Pro Phe Asp Gly Phe Pro Lys Ile Val Lys Ile Ile Val
            20                  25                  30

Thr Asp Pro Cys Ala Thr Asp Ser Ser Ser Asp Glu Glu Asn Asp Asn
```

35 40 45

Lys Ser Val Ala Pro Arg Val Lys Arg Tyr Val Asp Glu Ile Arg Phe
50 55 60

Cys Asp Glu Asp Asp Glu Pro Lys Pro Ala Arg Lys Ala Lys Lys Lys
65 70 75 80

Ser Pro Ala Ala Ala Ala Glu Asn Gly Gly Asp Leu Val Lys Ser Val
85 90 95

Val Lys Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Phe Ala Ala
100 105 110

Glu Ile Arg Asp Pro Ser Ser Arg Thr Arg Leu Trp Leu Gly Thr Phe
115 120 125

Ala Thr Ala Glu Glu Ala Ala Ile Gly Tyr Asp Arg Ala Ala Ile Arg
130 135 140

Ile Lys Gly His Asn Ala Gln Thr Asn Phe Leu Thr Pro Pro Pro Ser
145 150 155 160

Pro Thr Thr Glu Val Leu Pro Glu Thr Pro Val Ile Asp Leu Glu Thr
165 170 175

Val Ser Gly Cys Asp Ser Ala Arg Glu Ser Gln Ile Ser Leu Cys Ser
180 185 190

Pro Thr Ser Val Leu Arg Phe Ser His Asn Asp Glu Thr Glu Tyr Arg
195 200 205

Thr Glu Pro Thr Glu Glu Gln Asn Pro Phe Phe Leu Pro Asp Leu Phe
210 215 220

Arg Ser Gly Asp Tyr Phe Trp Asp Ser Glu Ile Thr Pro Asp Pro Leu
225 230 235 240

Phe Leu Asp Glu Phe His Gln Ser Leu Leu Pro Asn Ile Asn Asn Asn
245 250 255

Asn Thr Val Cys Asp Lys Asp Thr Asn Leu Ser Asp Ser Phe Pro Leu
260 265 270

```
Gly Val Ile Gly Asp Phe Ser Ser Trp Asp Val Asp Glu Phe Phe Gln
        275                 280                 285


Asp His Leu Leu Asp Lys
    290


<210>  311 <211>  813 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (132)..(689) <223>  G1020

 <400>  311
ctgttcacaa gaaagctccc caaaaggagc gttgctttac tctcctataa aaagaagctc     60

ttctacttct tctcgttacc acaaaactct ttcaccgatc ttctcgttcc attcttcttc    120

ctaattacac c atg ccc aac atc acc atg ggt ttg aaa ccc gac ccg gtt     170
             Met Pro Asn Ile Thr Met Gly Leu Lys Pro Asp Pro Val
             1               5                   10

gct cca acg aac ccg act cat cat gag agt aat gct gcc aaa gag att      218
Ala Pro Thr Asn Pro Thr His His Glu Ser Asn Ala Ala Lys Glu Ile
    15                  20                  25

cgt tac aga ggc gtt agg aaa cgt cca tgg gga aga tac gcc gct gag      266
Arg Tyr Arg Gly Val Arg Lys Arg Pro Trp Gly Arg Tyr Ala Ala Glu
30                  35                  40                  45

atc cga gat ccg gtt aag aaa act cga gtc tgg ctc ggt acg ttc gac      314
Ile Arg Asp Pro Val Lys Lys Thr Arg Val Trp Leu Gly Thr Phe Asp
                50                  55                  60

acc gct cag cag gcg gcg cgt gct tac gac gca gcc gcg cgt gac ttt      362
Thr Ala Gln Gln Ala Ala Arg Ala Tyr Asp Ala Ala Ala Arg Asp Phe
            65                  70                  75

cgt ggt gtt aag gct aag acc aat ttc ggt gtt atc gtt ggt agt agt      410
Arg Gly Val Lys Ala Lys Thr Asn Phe Gly Val Ile Val Gly Ser Ser
        80                  85                  90

cct act cag agt agc acc gtc gtc gac tct ccc acg gcg gca cgg ttt      458
Pro Thr Gln Ser Ser Thr Val Val Asp Ser Pro Thr Ala Ala Arg Phe
    95                  100                 105

ata aca cct ccg cac ctc gag ctc agc tta ggc ggc ggc ggc gcg tgt      506
Ile Thr Pro Pro His Leu Glu Leu Ser Leu Gly Gly Gly Gly Ala Cys
110                 115                 120                 125

cgt cgt aag atc ccg ctt gtg cat ccg gtt tac tac tat aac atg gcg      554
Arg Arg Lys Ile Pro Leu Val His Pro Val Tyr Tyr Tyr Asn Met Ala
                130                 135                 140

acg tat cca aag atg acg acg tgt ggt gtc cag agc gag tct gaa acg      602
Thr Tyr Pro Lys Met Thr Thr Cys Gly Val Gln Ser Glu Ser Glu Thr
            145                 150                 155
```

tcg tcg gtc gtt gat ttc gaa ggt gga gct ggg aag ata tct ccg ccg 650
Ser Ser Val Val Asp Phe Glu Gly Gly Ala Gly Lys Ile Ser Pro Pro
160 165 170

tta gat ctg gat ctt aac tta gct cct ccg gcg gaa tag gccgtgagtt 699
Leu Asp Leu Asp Leu Asn Leu Ala Pro Pro Ala Glu
175 180 185

ttttttttct tatgtcgttt ctttagacaa aaaaaaataa cgtttccttt ttttttctgc 759

ctaagaaaaa aatattatcc gttttttaga agaaaaaaaa aaaaaaaaaa aaaa 813

<210> 312 <211> 185 <212> PRT <213> Arabidopsis thaliana <400> 312

Met Pro Asn Ile Thr Met Gly Leu Lys Pro Asp Pro Val Ala Pro Thr
1 5 10 15

Asn Pro Thr His His Glu Ser Asn Ala Ala Lys Glu Ile Arg Tyr Arg
20 25 30

Gly Val Arg Lys Arg Pro Trp Gly Arg Tyr Ala Ala Glu Ile Arg Asp
35 40 45

Pro Val Lys Lys Thr Arg Val Trp Leu Gly Thr Phe Asp Thr Ala Gln
50 55 60

Gln Ala Ala Arg Ala Tyr Asp Ala Ala Ala Arg Asp Phe Arg Gly Val
65 70 75 80

Lys Ala Lys Thr Asn Phe Gly Val Ile Val Gly Ser Ser Pro Thr Gln
85 90 95

Ser Ser Thr Val Val Asp Ser Pro Thr Ala Ala Arg Phe Ile Thr Pro
100 105 110

Pro His Leu Glu Leu Ser Leu Gly Gly Gly Gly Ala Cys Arg Arg Lys
115 120 125

Ile Pro Leu Val His Pro Val Tyr Tyr Tyr Asn Met Ala Thr Tyr Pro
130 135 140

Lys Met Thr Thr Cys Gly Val Gln Ser Glu Ser Glu Thr Ser Ser Val
145 150 155 160

Val Asp Phe Glu Gly Gly Ala Gly Lys Ile Ser Pro Pro Leu Asp Leu

```
                165                 170                 175

Asp Leu Asn Leu Ala Pro Pro Ala Glu
            180                 185
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<210> 313 <211> 549 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (38)..(538) <223> G1053

<400> 313

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gaaactctta catactcata taaaccaaac taaaacc atg att ccg gca gaa atc      55
                                          Met Ile Pro Ala Glu Ile
                                          1               5

aac gga tat ttc caa tat cta tca ccg gaa tac aac gta ata aac atg      103
Asn Gly Tyr Phe Gln Tyr Leu Ser Pro Glu Tyr Asn Val Ile Asn Met
            10                  15                  20

cct tca tct cca acc tct tcc tta aac tac cta aac gat ttg atc atc      151
Pro Ser Ser Pro Thr Ser Ser Leu Asn Tyr Leu Asn Asp Leu Ile Ile
        25                  30                  35

aac aac aac aac tat tcc tca tca tcc aac agt caa gat ctc atg ata      199
Asn Asn Asn Asn Tyr Ser Ser Ser Ser Asn Ser Gln Asp Leu Met Ile
    40                  45                  50

agc aac aac tca act tcc gac gaa gat cat cat caa agc atc atg gta      247
Ser Asn Asn Ser Thr Ser Asp Glu Asp His His Gln Ser Ile Met Val
55                  60                  65                  70

ctc gac gag agg aaa cag aga agg atg ctt tcg aac aga gaa tct gca      295
Leu Asp Glu Arg Lys Gln Arg Arg Met Leu Ser Asn Arg Glu Ser Ala
                75                  80                  85

agg agg tca agg atg agg aaa cag aga cat ctt gat gaa ctc tgg tct      343
Arg Arg Ser Arg Met Arg Lys Gln Arg His Leu Asp Glu Leu Trp Ser
            90                  95                  100

cag gta ata agg ctt cgc aac gag aac aac tgt ctt atc gat aag ctg      391
Gln Val Ile Arg Leu Arg Asn Glu Asn Asn Cys Leu Ile Asp Lys Leu
        105                 110                 115

aac cgc gta tcg gag act caa aat tgt gta ttg aag gag aac tct aaa      439
Asn Arg Val Ser Glu Thr Gln Asn Cys Val Leu Lys Glu Asn Ser Lys
    120                 125                 130

ctc aaa gaa gaa gct tct gat ctc cga cag ctt gtt tgt gaa ctg aaa      487
Leu Lys Glu Glu Ala Ser Asp Leu Arg Gln Leu Val Cys Glu Leu Lys
135                 140                 145                 150

tct aac aag aac aac aac aat agt ttt cca aga gag ttt gaa gat aat      535
Ser Asn Lys Asn Asn Asn Asn Ser Phe Pro Arg Glu Phe Glu Asp Asn
                155                 160                 165

tag tattactcaa a                                                    549
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<210> 314 <211> 166 <212> PRT <213> Arabidopsis thaliana <400> 314

Met Ile Pro Ala Glu Ile Asn Gly Tyr Phe Gln Tyr Leu Ser Pro Glu
1 5 10 15

Tyr Asn Val Ile Asn Met Pro Ser Ser Pro Thr Ser Ser Leu Asn Tyr
20 25 30

Leu Asn Asp Leu Ile Ile Asn Asn Asn Asn Tyr Ser Ser Ser Ser Asn
35 40 45

Ser Gln Asp Leu Met Ile Ser Asn Asn Ser Thr Ser Asp Glu Asp His
50 55 60

His Gln Ser Ile Met Val Leu Asp Glu Arg Lys Gln Arg Arg Met Leu
65 70 75 80

Ser Asn Arg Glu Ser Ala Arg Arg Ser Arg Met Arg Lys Gln Arg His
85 90 95

Leu Asp Glu Leu Trp Ser Gln Val Ile Arg Leu Arg Asn Glu Asn Asn
100 105 110

Cys Leu Ile Asp Lys Leu Asn Arg Val Ser Glu Thr Gln Asn Cys Val
115 120 125

Leu Lys Glu Asn Ser Lys Leu Lys Glu Glu Ala Ser Asp Leu Arg Gln
130 135 140

Leu Val Cys Glu Leu Lys Ser Asn Lys Asn Asn Asn Asn Ser Phe Pro
145 150 155 160

Arg Glu Phe Glu Asp Asn
165

<210> 315 <211> 1311 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (202)..(1248) <223> G1137

<400> 315
tacttcagac ttctactcaa accagtcacg tagttggttg gtgacatttc gctgcatttt 60

tcaatctgtg attgtttttc gttcgtcttt cttttactat tttctcgaaa aggacacaag 120

aagtattgca ttcactcagt tgagcaactt aacaatcgtg ttgtactttt tgaagttccc 180

```
ttgagctaaa ctgctaagag c atg cct ctg gat aag agg caa cgg gat ttg      231
                        Met Pro Leu Asp Lys Arg Gln Arg Asp Leu
                        1               5                   10

cct ctg ggc tta agt cct caa gct tgc ttc aag gat ata gta ggt cgg      279
Pro Leu Gly Leu Ser Pro Gln Ala Cys Phe Lys Asp Ile Val Gly Arg
                15                  20                  25

tct gtc ctt cct aga att cct ctc cct gag ctt ggg aaa cta tat gca      327
Ser Val Leu Pro Arg Ile Pro Leu Pro Glu Leu Gly Lys Leu Tyr Ala
            30                  35                  40

gct aag ctt cag gct cgc tgt ttg cag cca cca cca ttc cag tct ttg      375
Ala Lys Leu Gln Ala Arg Cys Leu Gln Pro Pro Pro Phe Gln Ser Leu
        45                  50                  55

ctg tgc agt cat gat aag gag tct tat gga aaa aga ttc tca cgg tct      423
Leu Cys Ser His Asp Lys Glu Ser Tyr Gly Lys Arg Phe Ser Arg Ser
    60                  65                  70

gac atg cgg tct tgg tgc gct gct gct act act act act act cca ctt      471
Asp Met Arg Ser Trp Cys Ala Ala Ala Thr Thr Thr Thr Thr Pro Leu
75                  80                  85                  90

gga gca tta gag tct tct cag aaa aga ctt ttg ata ttc gat cag tca      519
Gly Ala Leu Glu Ser Ser Gln Lys Arg Leu Leu Ile Phe Asp Gln Ser
                95                  100                 105

gga gac cag act cgt cta tta caa tgt cca ttt cct cta cgg ttt cca      567
Gly Asp Gln Thr Arg Leu Leu Gln Cys Pro Phe Pro Leu Arg Phe Pro
            110                 115                 120

tct cat gcg gct gca gaa cca gtg aaa ctc tct gag tta caa ggt ata      615
Ser His Ala Ala Ala Glu Pro Val Lys Leu Ser Glu Leu Gln Gly Ile
        125                 130                 135

gag aaa gct ttc aaa gaa gat ggt gaa gag ttt cac aag agt gat gga      663
Glu Lys Ala Phe Lys Glu Asp Gly Glu Glu Phe His Lys Ser Asp Gly
    140                 145                 150

aca gag tca gaa atg cat gaa gac act gag gag atc aat gca ttg cta      711
Thr Glu Ser Glu Met His Glu Asp Thr Glu Glu Ile Asn Ala Leu Leu
155                 160                 165                 170

tat tca gat gat gat tat gat gat gat tgc gag agt gat gat gaa gta      759
Tyr Ser Asp Asp Asp Tyr Asp Asp Asp Cys Glu Ser Asp Asp Glu Val
                175                 180                 185

atg agc act ggt cac tct cct tat cca aat gaa gga gtt tgc aac aaa      807
Met Ser Thr Gly His Ser Pro Tyr Pro Asn Glu Gly Val Cys Asn Lys
            190                 195                 200

agg gaa tta gaa gaa atc gat ggt cct tgt aaa agg cag aaa cta ctg      855
Arg Glu Leu Glu Glu Ile Asp Gly Pro Cys Lys Arg Gln Lys Leu Leu
        205                 210                 215

gat aag gtc aac aac atc agc gac tta tca tca ctt gtg ggc act gag      903
```

```
Asp Lys Val Asn Asn Ile Ser Asp Leu Ser Ser Leu Val Gly Thr Glu
    220                 225                 230

agc tcc aca caa ctc aat gga tct tcc ttt ctt aag gac aaa aag ctc      951
Ser Ser Thr Gln Leu Asn Gly Ser Ser Phe Leu Lys Asp Lys Lys Leu
235                 240                 245                 250

cct gaa tca aaa acc ata tcg acc aaa gag gac act ggt tct ggt ctg      999
Pro Glu Ser Lys Thr Ile Ser Thr Lys Glu Asp Thr Gly Ser Gly Leu
                255                 260                 265

agc aac gag cag tcg aag aaa gac aag atc cgc aca gct ctg aaa ata     1047
Ser Asn Glu Gln Ser Lys Lys Asp Lys Ile Arg Thr Ala Leu Lys Ile
            270                 275                 280

ctc gag agc gta gtc cct ggt gca aaa gga aac gaa gcg ctc tta ctt     1095
Leu Glu Ser Val Val Pro Gly Ala Lys Gly Asn Glu Ala Leu Leu Leu
        285                 290                 295

ctg gac gaa gca att gat tac cta aag ttg ctg aaa cga gac tta atc     1143
Leu Asp Glu Ala Ile Asp Tyr Leu Lys Leu Leu Lys Arg Asp Leu Ile
    300                 305                 310

tcc aca gag gtt aag aac caa agc tcc acc act cac aag tca cca atc     1191
Ser Thr Glu Val Lys Asn Gln Ser Ser Thr Thr His Lys Ser Pro Ile
315                 320                 325                 330

ttg ttg ctt aaa gag aca aca tgg gga aca aga aat ctg cag aca gat     1239
Leu Leu Leu Lys Glu Thr Thr Trp Gly Thr Arg Asn Leu Gln Thr Asp
                335                 340                 345

aag gcg tga aagattctga cgagttaaaa cgtgtgaagt gggtttttgg             1288
Lys Ala

gtacgtatcc ttgcaccagc ttt                                          1311

<210>  316 <211>  348 <212>  PRT <213>  Arabidopsis thaliana  <400>  316

Met Pro Leu Asp Lys Arg Gln Arg Asp Leu Pro Leu Gly Leu Ser Pro
1               5                   10                  15

Gln Ala Cys Phe Lys Asp Ile Val Gly Arg Ser Val Leu Pro Arg Ile
            20                  25                  30

Pro Leu Pro Glu Leu Gly Lys Leu Tyr Ala Ala Lys Leu Gln Ala Arg
        35                  40                  45

Cys Leu Gln Pro Pro Pro Phe Gln Ser Leu Leu Cys Ser His Asp Lys
    50                  55                  60

Glu Ser Tyr Gly Lys Arg Phe Ser Arg Ser Asp Met Arg Ser Trp Cys
```

```
65                  70                  75                  80

Ala Ala Ala Thr Thr Thr Thr Thr Pro Leu Gly Ala Leu Glu Ser Ser
                85                  90                  95

Gln Lys Arg Leu Leu Ile Phe Asp Gln Ser Gly Asp Gln Thr Arg Leu
            100                 105                 110

Leu Gln Cys Pro Phe Pro Leu Arg Phe Pro Ser His Ala Ala Ala Glu
        115                 120                 125

Pro Val Lys Leu Ser Glu Leu Gln Gly Ile Glu Lys Ala Phe Lys Glu
    130                 135                 140

Asp Gly Glu Glu Phe His Lys Ser Asp Gly Thr Glu Ser Glu Met His
145                 150                 155                 160

Glu Asp Thr Glu Glu Ile Asn Ala Leu Leu Tyr Ser Asp Asp Asp Tyr
                165                 170                 175

Asp Asp Asp Cys Glu Ser Asp Asp Glu Val Met Ser Thr Gly His Ser
            180                 185                 190

Pro Tyr Pro Asn Glu Gly Val Cys Asn Lys Arg Glu Leu Glu Glu Ile
        195                 200                 205

Asp Gly Pro Cys Lys Arg Gln Lys Leu Leu Asp Lys Val Asn Asn Ile
    210                 215                 220

Ser Asp Leu Ser Ser Leu Val Gly Thr Glu Ser Ser Thr Gln Leu Asn
225                 230                 235                 240

Gly Ser Ser Phe Leu Lys Asp Lys Lys Leu Pro Glu Ser Lys Thr Ile
                245                 250                 255

Ser Thr Lys Glu Asp Thr Gly Ser Gly Leu Ser Asn Glu Gln Ser Lys
            260                 265                 270

Lys Asp Lys Ile Arg Thr Ala Leu Lys Ile Leu Glu Ser Val Val Pro
        275                 280                 285

Gly Ala Lys Gly Asn Glu Ala Leu Leu Leu Leu Asp Glu Ala Ile Asp
    290                 295                 300
```

Replacement Sheet

```
Tyr Leu Lys Leu Leu Lys Arg Asp Leu Ile Ser Thr Glu Val Lys Asn
305                 310                 315                 320

Gln Ser Ser Thr Thr His Lys Ser Pro Ile Leu Leu Leu Lys Glu Thr
                325                 330                 335

Thr Trp Gly Thr Arg Asn Leu Gln Thr Asp Lys Ala
            340                 345
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<210> 317 <211> 1239 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (113)..(1012) <223> G1181

<400> 317

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ctcgatcttt taacccccat tattacatat tactccttcc tacattattc ttcttctgct     60

ttcgtgactt tcaggggaca cttttgtttt tataacttac gcttaaaatc ct atg aat     118
                                                          Met Asn
                                                          1

tcg ccg ccg gtt gac gca atg att acc gga gaa tca tcg tca caa aga       166
Ser Pro Pro Val Asp Ala Met Ile Thr Gly Glu Ser Ser Ser Gln Arg
        5                   10                  15

tct atc cca acg ccg ttt ctc aca aaa acg ttt aac ctc gtt gaa gat       214
Ser Ile Pro Thr Pro Phe Leu Thr Lys Thr Phe Asn Leu Val Glu Asp
    20                  25                  30

agt tcc atc gac gat gtt atc tca tgg aac gaa gat ggt tcc tct ttc       262
Ser Ser Ile Asp Asp Val Ile Ser Trp Asn Glu Asp Gly Ser Ser Phe
35                  40                  45                  50

atc gta tgg aat ccg aca gat ttc gct aaa gat ttg ctt cct aaa cac       310
Ile Val Trp Asn Pro Thr Asp Phe Ala Lys Asp Leu Leu Pro Lys His
                55                  60                  65

ttc aaa cac aac aat ttc tct agt ttc gtt cgt cag ctc aac act tac       358
Phe Lys His Asn Asn Phe Ser Ser Phe Val Arg Gln Leu Asn Thr Tyr
            70                  75                  80

gga ttc aaa aaa gtt gta ccg gat cga tgg gag ttt tca aac gat ttc       406
Gly Phe Lys Lys Val Val Pro Asp Arg Trp Glu Phe Ser Asn Asp Phe
        85                  90                  95

ttt aag aga gga gaa aaa cgt ctt ctc cgt gag atc caa cgt cgg aaa       454
Phe Lys Arg Gly Glu Lys Arg Leu Leu Arg Glu Ile Gln Arg Arg Lys
    100                 105                 110

ata aca acg acg cat caa aca gtt gtt gct cct tcg tcg gaa caa cga       502
Ile Thr Thr Thr His Gln Thr Val Val Ala Pro Ser Ser Glu Gln Arg
115                 120                 125                 130

aac cag acg atg gtt gta tca ccg tca aat tcc ggg gaa gat aat aat       550
```

```
Asn Gln Thr Met Val Val Ser Pro Ser Asn Ser Gly Glu Asp Asn Asn
                135                 140                 145

aat aat cag gtg atg tct tcg tct ccg tcg tcg tgg tat tgt cat caa      598
Asn Asn Gln Val Met Ser Ser Ser Pro Ser Ser Trp Tyr Cys His Gln
            150                 155                 160

acg aag acg act ggg aat ggt ggt tta tca gtg gag tta ttg gaa gag      646
Thr Lys Thr Thr Gly Asn Gly Gly Leu Ser Val Glu Leu Leu Glu Glu
        165                 170                 175

aac gag aag ctt cgg agt caa aac att cag cta aac cgt gag ctt act      694
Asn Glu Lys Leu Arg Ser Gln Asn Ile Gln Leu Asn Arg Glu Leu Thr
    180                 185                 190

cag atg aaa tct atc tgc gat aat atc tat agt ctc atg tcg aat tac      742
Gln Met Lys Ser Ile Cys Asp Asn Ile Tyr Ser Leu Met Ser Asn Tyr
195                 200                 205                 210

gtc gga tct cag ccc act gat cgg agt tat tct ccc gga ggt agt agt      790
Val Gly Ser Gln Pro Thr Asp Arg Ser Tyr Ser Pro Gly Gly Ser Ser
                215                 220                 225

agt caa ccg atg gag ttt tta ccg gcg aag cgg ttt tcg gag atg gag      838
Ser Gln Pro Met Glu Phe Leu Pro Ala Lys Arg Phe Ser Glu Met Glu
            230                 235                 240

att gaa gaa gaa gaa gaa gcg agt ccg agg ttg ttt ggt gtt ccg att      886
Ile Glu Glu Glu Glu Glu Ala Ser Pro Arg Leu Phe Gly Val Pro Ile
        245                 250                 255

ggg tta aaa cgg acg aga agt gaa ggt gtt cag gtg aag acg acg gcg      934
Gly Leu Lys Arg Thr Arg Ser Glu Gly Val Gln Val Lys Thr Thr Ala
    260                 265                 270

gtg gtt ggg gaa aat tcc gat gag gag acg ccg tgg ttg aga cat tat      982
Val Val Gly Glu Asn Ser Asp Glu Glu Thr Pro Trp Leu Arg His Tyr
275                 280                 285                 290

aat cga acc aat cag aga gtt tgt aat taa aaacgaacgg tttagatttg       1032
Asn Arg Thr Asn Gln Arg Val Cys Asn
                295

tggtgtagat atgtgcgcga agtagacgat tacagctttt taagacaagc agagcacgtg   1092

tcccatctgt ttcaagaagt ttctgcaatc ttgacttctt cttttaacac tttgtgtttt   1152

ttattattta attaataaca ataaatgttc tttttcagtt ttgttttctt caaaaatagt   1212

tcggctgttt ctagactttc ctttttt                                      1239

<210>  318 <211>  299 <212>  PRT <213>  Arabidopsis thaliana  <400>  318

Met Asn Ser Pro Pro Val Asp Ala Met Ile Thr Gly Glu Ser Ser Ser
1               5                   10                  15
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Gln Arg Ser Ile Pro Thr Pro Phe Leu Thr Lys Thr Phe Asn Leu Val
20 25 30

Glu Asp Ser Ser Ile Asp Asp Val Ile Ser Trp Asn Glu Asp Gly Ser
35 40 45

Ser Phe Ile Val Trp Asn Pro Thr Asp Phe Ala Lys Asp Leu Leu Pro
50 55 60

Lys His Phe Lys His Asn Asn Phe Ser Ser Phe Val Arg Gln Leu Asn
65 70 75 80

Thr Tyr Gly Phe Lys Lys Val Val Pro Asp Arg Trp Glu Phe Ser Asn
85 90 95

Asp Phe Phe Lys Arg Gly Glu Lys Arg Leu Leu Arg Glu Ile Gln Arg
100 105 110

Arg Lys Ile Thr Thr Thr His Gln Thr Val Val Ala Pro Ser Ser Glu
115 120 125

Gln Arg Asn Gln Thr Met Val Val Ser Pro Ser Asn Ser Gly Glu Asp
130 135 140

Asn Asn Asn Asn Gln Val Met Ser Ser Ser Pro Ser Ser Trp Tyr Cys
145 150 155 160

His Gln Thr Lys Thr Thr Gly Asn Gly Gly Leu Ser Val Glu Leu Leu
165 170 175

Glu Glu Asn Glu Lys Leu Arg Ser Gln Asn Ile Gln Leu Asn Arg Glu
180 185 190

Leu Thr Gln Met Lys Ser Ile Cys Asp Asn Ile Tyr Ser Leu Met Ser
195 200 205

Asn Tyr Val Gly Ser Gln Pro Thr Asp Arg Ser Tyr Ser Pro Gly Gly
210 215 220

Ser Ser Ser Gln Pro Met Glu Phe Leu Pro Ala Lys Arg Phe Ser Glu
225 230 235 240

```
Met Glu Ile Glu Glu Glu Glu Ala Ser Pro Arg Leu Phe Gly Val
                245                 250                 255

Pro Ile Gly Leu Lys Arg Thr Arg Ser Glu Gly Val Gln Val Lys Thr
            260                 265                 270

Thr Ala Val Val Gly Glu Asn Ser Asp Glu Glu Thr Pro Trp Leu Arg
        275                 280                 285

His Tyr Asn Arg Thr Asn Gln Arg Val Cys Asn
    290                 295
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<210> 319 <211> 1196 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (63)..(1139) <223> G1228

09/25/2006 15:09:24

<400> 319

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gcatttataa ttactcactc atcttctttt cattacatta cataccaaac aagagctctc     60

aa atg gaa agg ttt caa gga cac atc aac ccc tgt ttc ttc gat cga       107
   Met Glu Arg Phe Gln Gly His Ile Asn Pro Cys Phe Phe Asp Arg
   1               5                  10                  15

aaa ccg gat gtg aga agc ctc gag gtt caa gga ttt gca gag gct caa      155
Lys Pro Asp Val Arg Ser Leu Glu Val Gln Gly Phe Ala Glu Ala Gln
               20                  25                  30

agc ttt gct ttc aaa gaa aaa gag gaa gaa agc tta caa gat aca gtt      203
Ser Phe Ala Phe Lys Glu Lys Glu Glu Glu Ser Leu Gln Asp Thr Val
           35                  40                  45

cca ttt cta cag atg ctg caa agt gaa gac ccc tca tcg ttt ttt tca      251
Pro Phe Leu Gln Met Leu Gln Ser Glu Asp Pro Ser Ser Phe Phe Ser
       50                  55                  60

atc aaa gag cca aac ttt ctg acg cta ctg tct ctt caa acc ctc aag      299
Ile Lys Glu Pro Asn Phe Leu Thr Leu Leu Ser Leu Gln Thr Leu Lys
   65                  70                  75

gag cct tgg gaa ctc gaa aga tat ctt tca ctt gag gat tca caa ttt      347
Glu Pro Trp Glu Leu Glu Arg Tyr Leu Ser Leu Glu Asp Ser Gln Phe
80                  85                  90                  95

cat tca ccg gtc caa tct gag acc aac cgc ttc atg gaa gga gcc aat      395
His Ser Pro Val Gln Ser Glu Thr Asn Arg Phe Met Glu Gly Ala Asn
               100                 105                 110

caa gct gtg tca agc caa gaa att ccc ttt agc caa gca aac atg aca      443
Gln Ala Val Ser Ser Gln Glu Ile Pro Phe Ser Gln Ala Asn Met Thr
           115                 120                 125

ctc cct tct tct acc tca tca cca ctc agt gca cat tca aga cga aag      491
Leu Pro Ser Ser Thr Ser Ser Pro Leu Ser Ala His Ser Arg Arg Lys
       130                 135                 140
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cgc aaa atc aac cac ttg ctg cct caa gaa atg act aga gaa aag aga      539
Arg Lys Ile Asn His Leu Leu Pro Gln Glu Met Thr Arg Glu Lys Arg
    145                 150                 155

aag agg agg aaa aca aaa cca agt aaa aac aat gaa gag att gag aat      587
Lys Arg Arg Lys Thr Lys Pro Ser Lys Asn Asn Glu Glu Ile Glu Asn
160                 165                 170                 175

caa aga ata aac cac att gct gtt gaa cga aac aga aga cgt caa atg      635
Gln Arg Ile Asn His Ile Ala Val Glu Arg Asn Arg Arg Arg Gln Met
                180                 185                 190

aac gaa cat atc aac tct ctc cgg gcc ctt ctc cca cct tcc tac atc      683
Asn Glu His Ile Asn Ser Leu Arg Ala Leu Leu Pro Pro Ser Tyr Ile
            195                 200                 205

caa cga gga gac caa gct tcc ata gta gga gga gca ata aac tac gtg      731
Gln Arg Gly Asp Gln Ala Ser Ile Val Gly Gly Ala Ile Asn Tyr Val
        210                 215                 220

aag gtc ctc gag caa atc ata caa tct ctc gaa tcg caa aag aga acg      779
Lys Val Leu Glu Gln Ile Ile Gln Ser Leu Glu Ser Gln Lys Arg Thr
    225                 230                 235

caa caa caa agt aac agt gag gta gta gaa aac gca ctt aat cat ctc      827
Gln Gln Gln Ser Asn Ser Glu Val Val Glu Asn Ala Leu Asn His Leu
240                 245                 250                 255

tca ggc att tcg tcg aac gac ctg tgg aca act ctt gaa gat caa act      875
Ser Gly Ile Ser Ser Asn Asp Leu Trp Thr Thr Leu Glu Asp Gln Thr
                260                 265                 270

tgt atc ccc aaa atc gaa gct aca gtg ata caa aac cat gtc agc ctt      923
Cys Ile Pro Lys Ile Glu Ala Thr Val Ile Gln Asn His Val Ser Leu
            275                 280                 285

aaa gtt caa tgt gag aag aaa caa gga caa ctt ctc aaa gga atc ata      971
Lys Val Gln Cys Glu Lys Lys Gln Gly Gln Leu Leu Lys Gly Ile Ile
        290                 295                 300

tca ctt gaa aag ctt aaa ctc act gtt ctt cat ctc aat atc act act     1019
Ser Leu Glu Lys Leu Lys Leu Thr Val Leu His Leu Asn Ile Thr Thr
    305                 310                 315

tcg tct cat tcc tct gtt tct tat tcc ttc aac ctc aag atg gaa gat     1067
Ser Ser His Ser Ser Val Ser Tyr Ser Phe Asn Leu Lys Met Glu Asp
320                 325                 330                 335

gag tgc gac tta gag tca gcc gac gag att acg gcg gct gtt cat cgg     1115
Glu Cys Asp Leu Glu Ser Ala Asp Glu Ile Thr Ala Ala Val His Arg
                340                 345                 350

att ttc gat att ccg aca att tga ttaaacacat ataattccaa aaatattaac    1169
Ile Phe Asp Ile Pro Thr Ile
            355
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agctgacaaa atggtatctt tgcggcc 1196

<210> 320 <211> 358 <212> PRT <213> Arabidopsis thaliana <400> 320

Met Glu Arg Phe Gln Gly His Ile Asn Pro Cys Phe Phe Asp Arg Lys
1 5 10 15

Pro Asp Val Arg Ser Leu Glu Val Gln Gly Phe Ala Glu Ala Gln Ser
20 25 30

Phe Ala Phe Lys Glu Lys Glu Glu Glu Ser Leu Gln Asp Thr Val Pro
35 40 45

Phe Leu Gln Met Leu Gln Ser Glu Asp Pro Ser Ser Phe Phe Ser Ile
50 55 60

Lys Glu Pro Asn Phe Leu Thr Leu Leu Ser Leu Gln Thr Leu Lys Glu
65 70 75 80

Pro Trp Glu Leu Glu Arg Tyr Leu Ser Leu Glu Asp Ser Gln Phe His
85 90 95

Ser Pro Val Gln Ser Glu Thr Asn Arg Phe Met Glu Gly Ala Asn Gln
100 105 110

Ala Val Ser Ser Gln Glu Ile Pro Phe Ser Gln Ala Asn Met Thr Leu
115 120 125

Pro Ser Ser Thr Ser Ser Pro Leu Ser Ala His Ser Arg Arg Lys Arg
130 135 140

Lys Ile Asn His Leu Leu Pro Gln Glu Met Thr Arg Glu Lys Arg Lys
145 150 155 160

Arg Arg Lys Thr Lys Pro Ser Lys Asn Asn Glu Glu Ile Glu Asn Gln
165 170 175

Arg Ile Asn His Ile Ala Val Glu Arg Asn Arg Arg Arg Gln Met Asn
180 185 190

Glu His Ile Asn Ser Leu Arg Ala Leu Leu Pro Pro Ser Tyr Ile Gln
195 200 205

```
Arg Gly Asp Gln Ala Ser Ile Val Gly Gly Ala Ile Asn Tyr Val Lys
    210                 215                 220

Val Leu Glu Gln Ile Ile Gln Ser Leu Glu Ser Gln Lys Arg Thr Gln
225                 230                 235                 240

Gln Gln Ser Asn Ser Glu Val Val Glu Asn Ala Leu Asn His Leu Ser
                245                 250                 255

Gly Ile Ser Ser Asn Asp Leu Trp Thr Thr Leu Glu Asp Gln Thr Cys
            260                 265                 270

Ile Pro Lys Ile Glu Ala Thr Val Ile Gln Asn His Val Ser Leu Lys
        275                 280                 285

Val Gln Cys Glu Lys Lys Gln Gly Gln Leu Leu Lys Gly Ile Ile Ser
    290                 295                 300

Leu Glu Lys Leu Lys Leu Thr Val Leu His Leu Asn Ile Thr Thr Ser
305                 310                 315                 320

Ser His Ser Ser Val Ser Tyr Ser Phe Asn Leu Lys Met Glu Asp Glu
                325                 330                 335

Cys Asp Leu Glu Ser Ala Asp Glu Ile Thr Ala Ala Val His Arg Ile
            340                 345                 350

Phe Asp Ile Pro Thr Ile
        355
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<210> 321 <211> 911 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (51)..(512) <223> G1277

<400> 321

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attctaaagt cctcctctcg gaaagtaaga gactcaactt ccgagccgcc atg gac        56
                                                        Met Asp
                                                        1

gcc gga gta gca gta aaa gct gac gtg gca gtc aaa atg aag aga gaa       104
Ala Gly Val Ala Val Lys Ala Asp Val Ala Val Lys Met Lys Arg Glu
        5                   10                  15

aga cca ttc aaa ggg atc aga atg aga aaa tgg ggg aaa tgg gtt gcg       152
Arg Pro Phe Lys Gly Ile Arg Met Arg Lys Trp Gly Lys Trp Val Ala
    20                  25                  30

gag att cga gaa ccc aac aag cgt tca aga ctt tgg ctc ggc tct tac      200
```

Glu Ile Arg Glu Pro Asn Lys Arg Ser Arg Leu Trp Leu Gly Ser Tyr
35 40 45 50

tct act ccc gaa gcg gcg gcg cgt gca tac gac acg gct gtc ttt tac 248
Ser Thr Pro Glu Ala Ala Ala Arg Ala Tyr Asp Thr Ala Val Phe Tyr
55 60 65

ctc aga gga cca act gct acg ctc aac ttc ccg gag ctt ctg ccg tgt 296
Leu Arg Gly Pro Thr Ala Thr Leu Asn Phe Pro Glu Leu Leu Pro Cys
70 75 80

acc tcc gcc gag gat atg tca gcg gca acg atc agg aaa aag gcg acg 344
Thr Ser Ala Glu Asp Met Ser Ala Ala Thr Ile Arg Lys Lys Ala Thr
85 90 95

gag gtg gga gct caa gta gat gcg ata ggg gcg acg gtg gtg cag aac 392
Glu Val Gly Ala Gln Val Asp Ala Ile Gly Ala Thr Val Val Gln Asn
100 105 110

aac aaa cgc cgc cgc gtt ttt agt caa aag cgt gac ttt ggc ggc ggg 440
Asn Lys Arg Arg Arg Val Phe Ser Gln Lys Arg Asp Phe Gly Gly Gly
115 120 125 130

tta tta gag ctt gtt gac ttg aac aag tta cct gac ccg gaa aat ctc 488
Leu Leu Glu Leu Val Asp Leu Asn Lys Leu Pro Asp Pro Glu Asn Leu
135 140 145

gat gat gat ttg gtg gga aaa tag actgaaaaat aataataaaa tatcttacaa 542
Asp Asp Asp Leu Val Gly Lys
150

tggtggctgt agctatcgta cgcggaatgc ttgggcttgt gttatatgac tacgtggtta 602

cggaaagatt cctctgtttc gtcattgtat taaaatttaa tcccacaagt caaacatact 662

gtacattatt cttaatttag tattttctta ttaatatcta tcatttgttt ggtgaacacc 722

agaatattag actattaatg taacgagttt ttaatatttc gatcataata acaccaagct 782

agttaaaggt taatatcttg ttacgaagtc ttgagtaagt tcaattgtca tatatatgta 842

acggaagagg ttcgttcggg tcccaagtga agtggatcaa aggtgacttc acataaaaaa 902

taaaaaaaa 911

<210> 322 <211> 153 <212> PRT <213> Arabidopsis thaliana <400> 322

Met Asp Ala Gly Val Ala Val Lys Ala Asp Val Ala Val Lys Met Lys
1 5 10 15

Arg Glu Arg Pro Phe Lys Gly Ile Arg Met Arg Lys Trp Gly Lys Trp
20 25 30

Val Ala Glu Ile Arg Glu Pro Asn Lys Arg Ser Arg Leu Trp Leu Gly

```
        35                  40                  45

Ser Tyr Ser Thr Pro Glu Ala Ala Ala Arg Ala Tyr Asp Thr Ala Val
    50                  55                  60

Phe Tyr Leu Arg Gly Pro Thr Ala Thr Leu Asn Phe Pro Glu Leu Leu
65                  70                  75                  80

Pro Cys Thr Ser Ala Glu Asp Met Ser Ala Ala Thr Ile Arg Lys Lys
                85                  90                  95

Ala Thr Glu Val Gly Ala Gln Val Asp Ala Ile Gly Ala Thr Val Val
            100                 105                 110

Gln Asn Asn Lys Arg Arg Arg Val Phe Ser Gln Lys Arg Asp Phe Gly
        115                 120                 125

Gly Gly Leu Leu Glu Leu Val Asp Leu Asn Lys Leu Pro Asp Pro Glu
    130                 135                 140

Asn Leu Asp Asp Asp Leu Val Gly Lys
145                 150

<210>  323 <211>  912 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (53)..(859) <223>  G1309

 <400>  323
cgtcgacctc ttaattaaga cgacttgaga gagaaagaaa gatacgtgga ag atg acc     58
                                                        Met Thr
                                                        1

aaa tct gga gag aga cca aaa cag aga cag agg aaa ggg tta tgg tca      106
Lys Ser Gly Glu Arg Pro Lys Gln Arg Gln Arg Lys Gly Leu Trp Ser
        5                   10                  15

cct gaa gaa gac cag aag ctc aag agt ttc atc ctc tct cgt ggc cat      154
Pro Glu Glu Asp Gln Lys Leu Lys Ser Phe Ile Leu Ser Arg Gly His
    20                  25                  30

gct tgc tgg acc act gtt ccc atc cta gct gga ttg caa agg aat ggg      202
Ala Cys Trp Thr Thr Val Pro Ile Leu Ala Gly Leu Gln Arg Asn Gly
35                  40                  45                  50

aaa agc tgc aga tta agg tgg att aat tac cta aga cca gga cta aag      250
Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Pro Gly Leu Lys
                55                  60                  65

agg ggg tcg ttt agt gaa gaa gaa gaa gag acc atc ttg act tta cat      298
Arg Gly Ser Phe Ser Glu Glu Glu Glu Glu Thr Ile Leu Thr Leu His
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            70                  75                  80

tct tcc ttg ggt aac aag tgg tct cgg att gca aaa tat tta ccg gga      346
Ser Ser Leu Gly Asn Lys Trp Ser Arg Ile Ala Lys Tyr Leu Pro Gly
        85                  90                  95

aga aca gac aac gag att aag aac tat tgg cat tcc tat ctg aag aag      394
Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp His Ser Tyr Leu Lys Lys
    100                 105                 110

aga tgg ctc aaa tct caa cca caa ctc aaa agc caa ata tca gac ctc      442
Arg Trp Leu Lys Ser Gln Pro Gln Leu Lys Ser Gln Ile Ser Asp Leu
115                 120                 125                 130

aca gaa tct cct tct tca cta ctt tct tgc ggg aaa aga aat ctg gaa      490
Thr Glu Ser Pro Ser Ser Leu Leu Ser Cys Gly Lys Arg Asn Leu Glu
                135                 140                 145

acc gaa acc cta gat cac gtg atc tcc ttc cag aaa ttt tca gag aat      538
Thr Glu Thr Leu Asp His Val Ile Ser Phe Gln Lys Phe Ser Glu Asn
            150                 155                 160

cca act tca tca cca tcc aaa gaa agc aac aac aac atg atc atg aac      586
Pro Thr Ser Ser Pro Ser Lys Glu Ser Asn Asn Asn Met Ile Met Asn
        165                 170                 175

aac agt aat aac ttg cct aaa ctg ttc ttc tct gag tgg atc agt tct      634
Asn Ser Asn Asn Leu Pro Lys Leu Phe Phe Ser Glu Trp Ile Ser Ser
    180                 185                 190

tca aat cca cac atc gat tac tcc tct gct ttt aca gat tcc aag cac      682
Ser Asn Pro His Ile Asp Tyr Ser Ser Ala Phe Thr Asp Ser Lys His
195                 200                 205                 210

att aat gaa act caa gat caa atc aat gaa gag gaa gtg atg atg atc      730
Ile Asn Glu Thr Gln Asp Gln Ile Asn Glu Glu Glu Val Met Met Ile
                215                 220                 225

aat aac aac aac tac tct tca ctt gag gat gtc atg ctc cgt aca gat      778
Asn Asn Asn Asn Tyr Ser Ser Leu Glu Asp Val Met Leu Arg Thr Asp
            230                 235                 240

ttt ttg cag cct gat cat gaa tat gca aat tat tat tct tct gga gat      826
Phe Leu Gln Pro Asp His Glu Tyr Ala Asn Tyr Tyr Ser Ser Gly Asp
        245                 250                 255

ttc ttc atc aac agt gac caa aat tat gtc taa gaagagtgaa tatgatcgta    879
Phe Phe Ile Asn Ser Asp Gln Asn Tyr Val
    260                 265

agaggaacat aagctagtta cttgtgttac agc                                 912

<210>  324 <211>  268 <212>  PRT <213>  Arabidopsis thaliana  <400>  324

Met Thr Lys Ser Gly Glu Arg Pro Lys Gln Arg Gln Arg Lys Gly Leu
1               5                   10                  15
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Trp Ser Pro Glu Glu Asp Gln Lys Leu Lys Ser Phe Ile Leu Ser Arg
20 25 30

Gly His Ala Cys Trp Thr Thr Val Pro Ile Leu Ala Gly Leu Gln Arg
35 40 45

Asn Gly Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Pro Gly
50 55 60

Leu Lys Arg Gly Ser Phe Ser Glu Glu Glu Glu Glu Thr Ile Leu Thr
65 70 75 80

Leu His Ser Ser Leu Gly Asn Lys Trp Ser Arg Ile Ala Lys Tyr Leu
85 90 95

Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp His Ser Tyr Leu
100 105 110

Lys Lys Arg Trp Leu Lys Ser Gln Pro Gln Leu Lys Ser Gln Ile Ser
115 120 125

Asp Leu Thr Glu Ser Pro Ser Ser Leu Leu Ser Cys Gly Lys Arg Asn
130 135 140

Leu Glu Thr Glu Thr Leu Asp His Val Ile Ser Phe Gln Lys Phe Ser
145 150 155 160

Glu Asn Pro Thr Ser Ser Pro Ser Lys Glu Ser Asn Asn Asn Met Ile
165 170 175

Met Asn Asn Ser Asn Asn Leu Pro Lys Leu Phe Phe Ser Glu Trp Ile
180 185 190

Ser Ser Ser Asn Pro His Ile Asp Tyr Ser Ser Ala Phe Thr Asp Ser
195 200 205

Lys His Ile Asn Glu Thr Gln Asp Gln Ile Asn Glu Glu Glu Val Met
210 215 220

Met Ile Asn Asn Asn Asn Tyr Ser Ser Leu Glu Asp Val Met Leu Arg
225 230 235 240

```
Thr Asp Phe Leu Gln Pro Asp His Glu Tyr Ala Asn Tyr Tyr Ser Ser
                245                 250                 255

Gly Asp Phe Phe Ile Asn Ser Asp Gln Asn Tyr Val
            260                 265
```

<210> 325 <211> 2008 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (90)..(1763) <223> G1382

<400> 325

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ctctcatttc gccatagctg agagcttctt ctactttccc ttagcttctt ttttccttca     60

tttttgttct acccttgcga atctctgaa atg aac cct caa gct aat gac cgg      113
                                Met Asn Pro Gln Ala Asn Asp Arg
                                1               5

aag gag ttt cag gga gat tgt tcg gcg acg gga gat ctc acg gca aag      161
Lys Glu Phe Gln Gly Asp Cys Ser Ala Thr Gly Asp Leu Thr Ala Lys
    10                  15                  20

cac gat tca gct gga gga aac gga ggt gga ggt gct agg tat aag ctg      209
His Asp Ser Ala Gly Gly Asn Gly Gly Gly Gly Ala Arg Tyr Lys Leu
25                  30                  35                  40

atg tca ccg gcc aag ctt ccg atc tcg agg tcg act gat atc acg att      257
Met Ser Pro Ala Lys Leu Pro Ile Ser Arg Ser Thr Asp Ile Thr Ile
                45                  50                  55

cct cct ggg ttg agt ccg act tcg ttt ttg gaa tct cct gtt ttc atc      305
Pro Pro Gly Leu Ser Pro Thr Ser Phe Leu Glu Ser Pro Val Phe Ile
            60                  65                  70

tcc aac atc aag cca gaa cct tcc cct act act ggt tct ttg ttc aag      353
Ser Asn Ile Lys Pro Glu Pro Ser Pro Thr Thr Gly Ser Leu Phe Lys
        75                  80                  85

cct cga cca gtg cac att tct gct agc tca agt tct tat aca ggc agg      401
Pro Arg Pro Val His Ile Ser Ala Ser Ser Ser Ser Tyr Thr Gly Arg
    90                  95                  100

ggg ttc cat cag aac acc ttt act gag cag aag tcc agt gaa ttt gag      449
Gly Phe His Gln Asn Thr Phe Thr Glu Gln Lys Ser Ser Glu Phe Glu
105                 110                 115                 120

ttc aga cct cct gca tca aat atg gta tat gca gag ctt ggc aag att      497
Phe Arg Pro Pro Ala Ser Asn Met Val Tyr Ala Glu Leu Gly Lys Ile
                125                 130                 135

aga agt gag cca cca gta cat ttt caa ggc cag ggc cat gga tcc tca      545
Arg Ser Glu Pro Pro Val His Phe Gln Gly Gln Gly His Gly Ser Ser
            140                 145                 150

cac tca cct tct tcg atc agt gat gct gca ggt tcc tca agt gag cta      593
His Ser Pro Ser Ser Ile Ser Asp Ala Ala Gly Ser Ser Ser Glu Leu
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        155                 160                 165

agc cgg cca act cct cct tgt cag atg aca cca acg agc tca gat att      641
Ser Arg Pro Thr Pro Pro Cys Gln Met Thr Pro Thr Ser Ser Asp Ile
    170                 175                 180

ccg gct gga tct gat caa gag gaa tca atc cag act tcc caa aat gac      689
Pro Ala Gly Ser Asp Gln Glu Glu Ser Ile Gln Thr Ser Gln Asn Asp
185                 190                 195                 200

tcc aga gga agc act cca tcc atc ttg gct gat gat ggt tat aac tgg      737
Ser Arg Gly Ser Thr Pro Ser Ile Leu Ala Asp Asp Gly Tyr Asn Trp
                205                 210                 215

aga aaa tat ggt caa aag cat gtc aaa ggg agt gaa ttt ccc cgg agc      785
Arg Lys Tyr Gly Gln Lys His Val Lys Gly Ser Glu Phe Pro Arg Ser
            220                 225                 230

tat tat aaa tgt aca cat cct aat tgt gaa gtg aaa aag tta ttt gaa      833
Tyr Tyr Lys Cys Thr His Pro Asn Cys Glu Val Lys Lys Leu Phe Glu
        235                 240                 245

aga tct cat gat ggg cag atc acc gat att ata tac aag ggt aca cat      881
Arg Ser His Asp Gly Gln Ile Thr Asp Ile Ile Tyr Lys Gly Thr His
    250                 255                 260

gac cat cct aaa cct caa cct ggt cgc cga aac tct ggt ggt atg gct      929
Asp His Pro Lys Pro Gln Pro Gly Arg Arg Asn Ser Gly Gly Met Ala
265                 270                 275                 280

gca caa gaa gaa agg cta gac aag tat cct tct tca act ggc cga gat      977
Ala Gln Glu Glu Arg Leu Asp Lys Tyr Pro Ser Ser Thr Gly Arg Asp
                285                 290                 295

gag aag gga tct ggc gtc tac aac ttg tct aac ccc aat gaa caa act     1025
Glu Lys Gly Ser Gly Val Tyr Asn Leu Ser Asn Pro Asn Glu Gln Thr
            300                 305                 310

ggt aac cct gaa gta cct cct atc tca gca tct gac gat ggt gga gaa     1073
Gly Asn Pro Glu Val Pro Pro Ile Ser Ala Ser Asp Asp Gly Gly Glu
        315                 320                 325

gcg gca gcg tca aat agg aat aaa gat gag ccg gac gat gat gat cca     1121
Ala Ala Ala Ser Asn Arg Asn Lys Asp Glu Pro Asp Asp Asp Asp Pro
    330                 335                 340

ttc tca aaa cgg agg agg atg gag ggt gcg atg gaa ata act cca cta     1169
Phe Ser Lys Arg Arg Arg Met Glu Gly Ala Met Glu Ile Thr Pro Leu
345                 350                 355                 360

gtg aaa ccc atc cgg gag cct cgg gtt gtt gtt caa act ctg agt gag     1217
Val Lys Pro Ile Arg Glu Pro Arg Val Val Val Gln Thr Leu Ser Glu
                365                 370                 375

gtt gac att ctg gat gat ggt tat aga tgg cgc aaa tat ggg cag aaa     1265
Val Asp Ile Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys
            380                 385                 390
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gtc gta agg ggg aac cca aat ccc agg agc tac tac aaa tgc aca gct 1313
Val Val Arg Gly Asn Pro Asn Pro Arg Ser Tyr Tyr Lys Cys Thr Ala
395 400 405

cat gga tgc cca gtg aga aaa cac gtg gag aga gca tca cat gat cca 1361
His Gly Cys Pro Val Arg Lys His Val Glu Arg Ala Ser His Asp Pro
410 415 420

aaa gct gta ata aca aca tac gaa ggc aaa cac gat cat gat gtt ccc 1409
Lys Ala Val Ile Thr Thr Tyr Glu Gly Lys His Asp His Asp Val Pro
425 430 435 440

act tca aag tct agc agc aat cac gaa atc cag cct cgg ttc aga cca 1457
Thr Ser Lys Ser Ser Ser Asn His Glu Ile Gln Pro Arg Phe Arg Pro
445 450 455

gat gaa aca gac acc atc agc ctc aat ctt ggt gtt gga atc tca tct 1505
Asp Glu Thr Asp Thr Ile Ser Leu Asn Leu Gly Val Gly Ile Ser Ser
460 465 470

gat gga cct aac cac gct tcc aac gaa cat cag cac cag aat caa caa 1553
Asp Gly Pro Asn His Ala Ser Asn Glu His Gln His Gln Asn Gln Gln
475 480 485

ctt gtc aac caa act cac cca aat gga gtc aat ttc agg ttt gtt cat 1601
Leu Val Asn Gln Thr His Pro Asn Gly Val Asn Phe Arg Phe Val His
490 495 500

gct agt ccc atg tca tcc tac tat gct agc tta aat agc ggt atg aat 1649
Ala Ser Pro Met Ser Ser Tyr Tyr Ala Ser Leu Asn Ser Gly Met Asn
505 510 515 520

cag tac ggc cag aga gaa aca aag aac gag act caa aat ggt gac atc 1697
Gln Tyr Gly Gln Arg Glu Thr Lys Asn Glu Thr Gln Asn Gly Asp Ile
525 530 535

tcg tcc ttg aac aat tca tct tac cca tat ccg ccc aac atg ggg aga 1745
Ser Ser Leu Asn Asn Ser Ser Tyr Pro Tyr Pro Pro Asn Met Gly Arg
540 545 550

gta caa tcg ggt ccg taa aacaaaaagt aagcaacatt atgtacggga 1793
Val Gln Ser Gly Pro
555

tcttcttagg ttaggaatgg gacgaggcct tgttctatat aattcctatt tcttcacaga 1853

gagctgatct tgattcaaac tatctccacc atatatattt gtttgtgtca cctgtattga 1913

gttccaaaaa tgttatgtaa aaatacacaa caagatgtta atgcttttat ttaaacaaga 1973

aacagcaata ttactacaaa aaaaaaaaaa aaaaa 2008

<210> 326 <211> 557 <212> PRT <213> Arabidopsis thaliana <400> 326

Met Asn Pro Gln Ala Asn Asp Arg Lys Glu Phe Gln Gly Asp Cys Ser

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1               5                   10                  15

Ala Thr Gly Asp Leu Thr Ala Lys His Asp Ser Ala Gly Gly Asn Gly
            20                  25                  30

Gly Gly Gly Ala Arg Tyr Lys Leu Met Ser Pro Ala Lys Leu Pro Ile
        35                  40                  45

Ser Arg Ser Thr Asp Ile Thr Ile Pro Pro Gly Leu Ser Pro Thr Ser
    50                  55                  60

Phe Leu Glu Ser Pro Val Phe Ile Ser Asn Ile Lys Pro Glu Pro Ser
65                  70                  75                  80

Pro Thr Thr Gly Ser Leu Phe Lys Pro Arg Pro Val His Ile Ser Ala
                85                  90                  95

Ser Ser Ser Ser Tyr Thr Gly Arg Gly Phe His Gln Asn Thr Phe Thr
            100                 105                 110

Glu Gln Lys Ser Ser Glu Phe Glu Phe Arg Pro Pro Ala Ser Asn Met
        115                 120                 125

Val Tyr Ala Glu Leu Gly Lys Ile Arg Ser Glu Pro Pro Val His Phe
    130                 135                 140

Gln Gly Gln Gly His Gly Ser Ser His Ser Pro Ser Ser Ile Ser Asp
145                 150                 155                 160

Ala Ala Gly Ser Ser Ser Glu Leu Ser Arg Pro Thr Pro Pro Cys Gln
                165                 170                 175

Met Thr Pro Thr Ser Ser Asp Ile Pro Ala Gly Ser Asp Gln Glu Glu
            180                 185                 190

Ser Ile Gln Thr Ser Gln Asn Asp Ser Arg Gly Ser Thr Pro Ser Ile
        195                 200                 205

Leu Ala Asp Asp Gly Tyr Asn Trp Arg Lys Tyr Gly Gln Lys His Val
    210                 215                 220

Lys Gly Ser Glu Phe Pro Arg Ser Tyr Tyr Lys Cys Thr His Pro Asn
225                 230                 235                 240
```

Cys Glu Val Lys Lys Leu Phe Glu Arg Ser His Asp Gly Gln Ile Thr
245 250 255

Asp Ile Ile Tyr Lys Gly Thr His Asp His Pro Lys Pro Gln Pro Gly
260 265 270

Arg Arg Asn Ser Gly Gly Met Ala Ala Gln Glu Glu Arg Leu Asp Lys
275 280 285

Tyr Pro Ser Ser Thr Gly Arg Asp Glu Lys Gly Ser Gly Val Tyr Asn
290 295 300

Leu Ser Asn Pro Asn Glu Gln Thr Gly Asn Pro Glu Val Pro Pro Ile
305 310 315 320

Ser Ala Ser Asp Asp Gly Gly Glu Ala Ala Ala Ser Asn Arg Asn Lys
325 330 335

Asp Glu Pro Asp Asp Asp Asp Pro Phe Ser Lys Arg Arg Arg Met Glu
340 345 350

Gly Ala Met Glu Ile Thr Pro Leu Val Lys Pro Ile Arg Glu Pro Arg
355 360 365

Val Val Val Gln Thr Leu Ser Glu Val Asp Ile Leu Asp Asp Gly Tyr
370 375 380

Arg Trp Arg Lys Tyr Gly Gln Lys Val Val Arg Gly Asn Pro Asn Pro
385 390 395 400

Arg Ser Tyr Tyr Lys Cys Thr Ala His Gly Cys Pro Val Arg Lys His
405 410 415

Val Glu Arg Ala Ser His Asp Pro Lys Ala Val Ile Thr Thr Tyr Glu
420 425 430

Gly Lys His Asp His Asp Val Pro Thr Ser Lys Ser Ser Ser Asn His
435 440 445

Glu Ile Gln Pro Arg Phe Arg Pro Asp Glu Thr Asp Thr Ile Ser Leu
450 455 460

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Asn Leu Gly Val Gly Ile Ser Ser Asp Gly Pro Asn His Ala Ser Asn
465                 470                 475                 480

Glu His Gln His Gln Asn Gln Gln Leu Val Asn Gln Thr His Pro Asn
                485                 490                 495

Gly Val Asn Phe Arg Phe Val His Ala Ser Pro Met Ser Ser Tyr Tyr
            500                 505                 510

Ala Ser Leu Asn Ser Gly Met Asn Gln Tyr Gly Gln Arg Glu Thr Lys
        515                 520                 525

Asn Glu Thr Gln Asn Gly Asp Ile Ser Ser Leu Asn Asn Ser Ser Tyr
    530                 535                 540

Pro Tyr Pro Pro Asn Met Gly Arg Val Gln Ser Gly Pro
545                 550                 555

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aagaagaaga gattgttgtt tttgcctttt atcatcggtt tctttgaatc tctggtttta    120

aatcggattt a atg gtg gag tct ctg ttc ccg agc atc gaa aac aca ggt      170
             Met Val Glu Ser Leu Phe Pro Ser Ile Glu Asn Thr Gly
             1               5                   10

gaa tcg tct cga aga aag aag ccg agg ata tca gag acg gcg gag gcg      218
Glu Ser Ser Arg Arg Lys Lys Pro Arg Ile Ser Glu Thr Ala Glu Ala
    15                  20                  25

gag ata gag gca cga cgt gtc aac gaa gaa agc ttg aag aga tgg aaa      266
Glu Ile Glu Ala Arg Arg Val Asn Glu Glu Ser Leu Lys Arg Trp Lys
30                  35                  40                  45

acg aat cgt gtg caa cag atc tac gct tgt aag ctc gtc gaa gct tta      314
Thr Asn Arg Val Gln Gln Ile Tyr Ala Cys Lys Leu Val Glu Ala Leu
                50                  55                  60

cgc cga gtt cgt cag aga tct tcc acc acc agc aac aac gag acc gat      362
Arg Arg Val Arg Gln Arg Ser Ser Thr Thr Ser Asn Asn Glu Thr Asp
            65                  70                  75

aaa ctc gtc tcc ggc gcg gcg agg gag ata cgt gat acg gcg gat cga      410
Lys Leu Val Ser Gly Ala Ala Arg Glu Ile Arg Asp Thr Ala Asp Arg
        80                  85                  90
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gtt cta gct gcg tcc gct cgt ggt acg act cgg tgg agc aga gcg att 458
Val Leu Ala Ala Ser Ala Arg Gly Thr Thr Arg Trp Ser Arg Ala Ile
95 100 105

tta gcg agt cgc gtc cga gcg aag ctg aag aaa cat aga aag gcg aaa 506
Leu Ala Ser Arg Val Arg Ala Lys Leu Lys Lys His Arg Lys Ala Lys
110 115 120 125

aag tca acg gga aat tgt aaa tcg aga aaa ggt ctc acg gag acg aat 554
Lys Ser Thr Gly Asn Cys Lys Ser Arg Lys Gly Leu Thr Glu Thr Asn
130 135 140

cgg att aag tta ccg gcg gtt gag aga aaa ctg aag att ctt ggc cgt 602
Arg Ile Lys Leu Pro Ala Val Glu Arg Lys Leu Lys Ile Leu Gly Arg
145 150 155

ttg gtt cct ggt tgc cgg aaa gtc tct gta ccg aat ctt tta gat gaa 650
Leu Val Pro Gly Cys Arg Lys Val Ser Val Pro Asn Leu Leu Asp Glu
160 165 170

gcg acc gat tac atc gca gcg tta gag atg cag gtt cga gcc atg gag 698
Ala Thr Asp Tyr Ile Ala Ala Leu Glu Met Gln Val Arg Ala Met Glu
175 180 185

gct ctc gcc gaa ctt tta acc gca gcc gca cca cgg acg acg ttg acc 746
Ala Leu Ala Glu Leu Leu Thr Ala Ala Ala Pro Arg Thr Thr Leu Thr
190 195 200 205

gga act taa cggcggcagt tagtttgtca gttgttaatt agcttttctt 795
Gly Thr

ttacctttt acccctttat tttggcttca agtgtttttt ttttctcgtc gacgcgattt 855

taatttatta aattca 871

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Met Val Glu Ser Leu Phe Pro Ser Ile Glu Asn Thr Gly Glu Ser Ser
1 5 10 15

Arg Arg Lys Lys Pro Arg Ile Ser Glu Thr Ala Glu Ala Glu Ile Glu
20 25 30

Ala Arg Arg Val Asn Glu Glu Ser Leu Lys Arg Trp Lys Thr Asn Arg
35 40 45

Val Gln Gln Ile Tyr Ala Cys Lys Leu Val Glu Ala Leu Arg Arg Val
50 55 60

Arg Gln Arg Ser Ser Thr Thr Ser Asn Asn Glu Thr Asp Lys Leu Val
65 70 75 80

Ser Gly Ala Ala Arg Glu Ile Arg Asp Thr Ala Asp Arg Val Leu Ala
85 90 95

Ala Ser Ala Arg Gly Thr Thr Arg Trp Ser Arg Ala Ile Leu Ala Ser
100 105 110

Arg Val Arg Ala Lys Leu Lys Lys His Arg Lys Ala Lys Lys Ser Thr
115 120 125

Gly Asn Cys Lys Ser Arg Lys Gly Leu Thr Glu Thr Asn Arg Ile Lys
130 135 140

Leu Pro Ala Val Glu Arg Lys Leu Lys Ile Leu Gly Arg Leu Val Pro
145 150 155 160

Gly Cys Arg Lys Val Ser Val Pro Asn Leu Leu Asp Glu Ala Thr Asp
165 170 175

Tyr Ile Ala Ala Leu Glu Met Gln Val Arg Ala Met Glu Ala Leu Ala
180 185 190

Glu Leu Leu Thr Ala Ala Ala Pro Arg Thr Thr Leu Thr Gly Thr
195 200 205

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tcttaattat actcaacaca cattatattt ttctgatcat atcattcttt cagtccatct 120

atataaccaa ttcttgattt atacttaaaa cacacattat acatctttct catcatagtt 180

tgtatcaatt tcctagagta aactacctaa aggaaaaaaa aaatctattt tgggaatcat 240

atactaaaa atg gaa gga aga gat atg tta agt tgg gag caa aag aca ttg 291
Met Glu Gly Arg Asp Met Leu Ser Trp Glu Gln Lys Thr Leu
1 5 10

cta agc gag ctt atc aat gga ttt gat gcg gcc aaa aag ctt cag gca 339
Leu Ser Glu Leu Ile Asn Gly Phe Asp Ala Ala Lys Lys Leu Gln Ala
15 20 25 30

cga ctt aga gaa gct ccg tcg ccg tcg tca tca ttt tca tca ccg gcg 387
Arg Leu Arg Glu Ala Pro Ser Pro Ser Ser Ser Phe Ser Ser Pro Ala
35 40 45

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acg gct gtt gct gag act aac gag att ctg gtg aag cag ata gtt tct      435
Thr Ala Val Ala Glu Thr Asn Glu Ile Leu Val Lys Gln Ile Val Ser
            50                  55                  60

tcc tac gag aga tct ctt ctt ctg cta aac tgg tca tcc tca ccg agc      483
Ser Tyr Glu Arg Ser Leu Leu Leu Leu Asn Trp Ser Ser Ser Pro Ser
        65                  70                  75

gta caa ctt att ccg acg ccg gtt act gta gtc ccg gtg gca aat ccc      531
Val Gln Leu Ile Pro Thr Pro Val Thr Val Val Pro Val Ala Asn Pro
    80                  85                  90

ggc agt gtt cca gaa tct ccg gca tcg ata aac gga agt ccg aga agt      579
Gly Ser Val Pro Glu Ser Pro Ala Ser Ile Asn Gly Ser Pro Arg Ser
95                  100                 105                 110

gaa gag ttt gcc gat gga gga ggt tct agc gag agt cat cat cgc caa      627
Glu Glu Phe Ala Asp Gly Gly Gly Ser Ser Glu Ser His His Arg Gln
                115                 120                 125

gat tac att ttc aat tca aag aaa aga aag atg tta cca aag tgg tca      675
Asp Tyr Ile Phe Asn Ser Lys Lys Arg Lys Met Leu Pro Lys Trp Ser
            130                 135                 140

gaa aaa gtg aga ata agc cca gag aga ggc tta gaa gga cct caa gat      723
Glu Lys Val Arg Ile Ser Pro Glu Arg Gly Leu Glu Gly Pro Gln Asp
        145                 150                 155

gat gtc ttt agc tgg aga aaa tat ggt caa aaa gac att tta ggc gcc      771
Asp Val Phe Ser Trp Arg Lys Tyr Gly Gln Lys Asp Ile Leu Gly Ala
    160                 165                 170

aaa ttc cca agg agt tat tac aga tgc aca cat cgt agc aca caa aac      819
Lys Phe Pro Arg Ser Tyr Tyr Arg Cys Thr His Arg Ser Thr Gln Asn
175                 180                 185                 190

tgt tgg gca acg aaa caa gtc cag aga tca gac ggg gat gct acg gtt      867
Cys Trp Ala Thr Lys Gln Val Gln Arg Ser Asp Gly Asp Ala Thr Val
                195                 200                 205

ttc gaa gtg acg tac aga gga aca cac act tgt tcg cag gcg atc aca      915
Phe Glu Val Thr Tyr Arg Gly Thr His Thr Cys Ser Gln Ala Ile Thr
            210                 215                 220

aga aca cca cca tta gcc tcg ccg gag aag cga caa gac acc aga gtc      963
Arg Thr Pro Pro Leu Ala Ser Pro Glu Lys Arg Gln Asp Thr Arg Val
        225                 230                 235

aaa cca gcc att acc caa aag cca aag gat att ctc gag agt ctt aaa     1011
Lys Pro Ala Ile Thr Gln Lys Pro Lys Asp Ile Leu Glu Ser Leu Lys
    240                 245                 250

tcc aac tta acc gtt cga acc gat ggg ctt gat gat ggt aaa gac gtt     1059
Ser Asn Leu Thr Val Arg Thr Asp Gly Leu Asp Asp Gly Lys Asp Val
255                 260                 265                 270
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ttc tcg ttc cct gat acg ccg ccg ttt tac aat tac gga act atc aac 1107
Phe Ser Phe Pro Asp Thr Pro Pro Phe Tyr Asn Tyr Gly Thr Ile Asn
275 280 285

ggc gag ttc ggc cac gtg gag agt tct ccg atc ttc gac gtt gtt gac 1155
Gly Glu Phe Gly His Val Glu Ser Ser Pro Ile Phe Asp Val Val Asp
290 295 300

tgg ttc aat cca acg gtc gag att gac aca act ttc ccc gcg ttt tta 1203
Trp Phe Asn Pro Thr Val Glu Ile Asp Thr Thr Phe Pro Ala Phe Leu
305 310 315

cac gag tcg att tat tat taa ttaaaatttg taacagagaa atagatagta 1254
His Glu Ser Ile Tyr Tyr
320

actagtaagt aatgatcagc gagagttaaa acataaaagt acttagagta atctaacgat 1314

gcataataag gaatgttcaa caggacttga acatgatttc aatactaaga gagatttatc 1374

tagctactgg tagtagccgc agacttcttg ttgtagcttc acttactttt tgttgctt 1432

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Met Glu Gly Arg Asp Met Leu Ser Trp Glu Gln Lys Thr Leu Leu Ser
1 5 10 15

Glu Leu Ile Asn Gly Phe Asp Ala Ala Lys Lys Leu Gln Ala Arg Leu
20 25 30

Arg Glu Ala Pro Ser Pro Ser Ser Ser Phe Ser Ser Pro Ala Thr Ala
35 40 45

Val Ala Glu Thr Asn Glu Ile Leu Val Lys Gln Ile Val Ser Ser Tyr
50 55 60

Glu Arg Ser Leu Leu Leu Leu Asn Trp Ser Ser Ser Pro Ser Val Gln
65 70 75 80

Leu Ile Pro Thr Pro Val Thr Val Val Pro Val Ala Asn Pro Gly Ser
85 90 95

Val Pro Glu Ser Pro Ala Ser Ile Asn Gly Ser Pro Arg Ser Glu Glu
100 105 110

Phe Ala Asp Gly Gly Gly Ser Ser Glu Ser His His Arg Gln Asp Tyr
115 120 125

Ile Phe Asn Ser Lys Lys Arg Lys Met Leu Pro Lys Trp Ser Glu Lys
130 135 140

Val Arg Ile Ser Pro Glu Arg Gly Leu Glu Gly Pro Gln Asp Asp Val
145 150 155 160

Phe Ser Trp Arg Lys Tyr Gly Gln Lys Asp Ile Leu Gly Ala Lys Phe
165 170 175

Pro Arg Ser Tyr Tyr Arg Cys Thr His Arg Ser Thr Gln Asn Cys Trp
180 185 190

Ala Thr Lys Gln Val Gln Arg Ser Asp Gly Asp Ala Thr Val Phe Glu
195 200 205

Val Thr Tyr Arg Gly Thr His Thr Cys Ser Gln Ala Ile Thr Arg Thr
210 215 220

Pro Pro Leu Ala Ser Pro Glu Lys Arg Gln Asp Thr Arg Val Lys Pro
225 230 235 240

Ala Ile Thr Gln Lys Pro Lys Asp Ile Leu Glu Ser Leu Lys Ser Asn
245 250 255

Leu Thr Val Arg Thr Asp Gly Leu Asp Asp Gly Lys Asp Val Phe Ser
260 265 270

Phe Pro Asp Thr Pro Pro Phe Tyr Asn Tyr Gly Thr Ile Asn Gly Glu
275 280 285

Phe Gly His Val Glu Ser Ser Pro Ile Phe Asp Val Val Asp Trp Phe
290 295 300

Asn Pro Thr Val Glu Ile Asp Thr Thr Phe Pro Ala Phe Leu His Glu
305 310 315 320

Ser Ile Tyr Tyr

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ttttggcaaa tcgtgaactg ccacgtcttt aaggcatcag tgaagcaaag atg gac       116
                                                          Met Asp
                                                          1

ttt gac gag gag cta aat ctt tgt att acg aaa ggt aaa aat gtt gat       164
Phe Asp Glu Glu Leu Asn Leu Cys Ile Thr Lys Gly Lys Asn Val Asp
        5                  10                  15

cat tct ttt gga gga gaa gct tct tcc acg tcc cca aga tct atg aag       212
His Ser Phe Gly Gly Glu Ala Ser Ser Thr Ser Pro Arg Ser Met Lys
    20                  25                  30

aaa atg aag agt cct agt cgt cct aaa ccc tat ttc caa tcc tct tct       260
Lys Met Lys Ser Pro Ser Arg Pro Lys Pro Tyr Phe Gln Ser Ser Ser
35                  40                  45                  50

tct cct tat tcg tta gag gct ttc cct ttt tct ctc gat cca aca ctt       308
Ser Pro Tyr Ser Leu Glu Ala Phe Pro Phe Ser Leu Asp Pro Thr Leu
                55                  60                  65

cag aat cag caa caa caa ctc gga tca tac gtt ccg gta ctt gag caa       356
Gln Asn Gln Gln Gln Gln Leu Gly Ser Tyr Val Pro Val Leu Glu Gln
            70                  75                  80

cga caa gac ccg aca atg caa ggc cag aag caa atg atc tcc ttt agt       404
Arg Gln Asp Pro Thr Met Gln Gly Gln Lys Gln Met Ile Ser Phe Ser
        85                  90                  95

cct caa caa caa caa cag cag cag cag tat atg gcc cag tac tgg agt       452
Pro Gln Gln Gln Gln Gln Gln Gln Gln Tyr Met Ala Gln Tyr Trp Ser
    100                 105                 110

gac aca ttg aat ctg agt cca aga gga aga atg atg atg atg atg agc       500
Asp Thr Leu Asn Leu Ser Pro Arg Gly Arg Met Met Met Met Met Ser
115                 120                 125                 130

caa gaa gct gtt caa cct tac atc gca acg aag ctg tac aga gga gtg       548
Gln Glu Ala Val Gln Pro Tyr Ile Ala Thr Lys Leu Tyr Arg Gly Val
                135                 140                 145

aga caa cgt caa tgg gga aaa tgg gtc gca gag atc cgt aag cca cga       596
Arg Gln Arg Gln Trp Gly Lys Trp Val Ala Glu Ile Arg Lys Pro Arg
            150                 155                 160

agc agg gca cgt ctt tgg ctt ggt acc ttt gat aca gct gaa gaa gct       644
Ser Arg Ala Arg Leu Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala
        165                 170                 175

gcc atg gcc tac gac cgc caa gcc ttc aaa tta cga ggc cac agc gca       692
Ala Met Ala Tyr Asp Arg Gln Ala Phe Lys Leu Arg Gly His Ser Ala
    180                 185                 190

aca ctg aat ttc ccg gag cat ttt gtg aat aag gaa agc gag ctg cat       740
Thr Leu Asn Phe Pro Glu His Phe Val Asn Lys Glu Ser Glu Leu His
195                 200                 205                 210
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gat tca aac tcg tcg gat cag aaa gaa cct gaa acg cca cag cca agc      788
Asp Ser Asn Ser Ser Asp Gln Lys Glu Pro Glu Thr Pro Gln Pro Ser
                215                 220                 225

gag gtt aac ttg gag agc aag gaa cta ccg gtg att gat gtt ggg aga      836
Glu Val Asn Leu Glu Ser Lys Glu Leu Pro Val Ile Asp Val Gly Arg
            230                 235                 240

gag gaa ggt atg gct gag gca tgg tac aat gcc att aca tcg gga tgg      884
Glu Glu Gly Met Ala Glu Ala Trp Tyr Asn Ala Ile Thr Ser Gly Trp
        245                 250                 255

ggt cct gaa agt cct ctt tgg gat gat ttg gat agt tct cat cag ttt      932
Gly Pro Glu Ser Pro Leu Trp Asp Asp Leu Asp Ser Ser His Gln Phe
    260                 265                 270

tca tca gaa agc tca tct tct tct cct ctc tct tgt cct atg agg cct      980
Ser Ser Glu Ser Ser Ser Ser Ser Pro Leu Ser Cys Pro Met Arg Pro
275                 280                 285                 290

ttc ttt tga aaaagtttat aaacccacat tgtgttgtag gttatagttt             1029
Phe Phe

agggttatgc tcattggcat ttggatggag gcaatttttg tgatctccca ttccaccaca   1089

tatcagtcat tatatgtgtc tacctttttct ctgtatttct atcattatca ttgtttttat   1149

tatgtgtctg tatgtgtttc cctattgcta catacataga tgtcctcttt gttcaaaaaa   1209

aaaaaaaaaa aaaaaaa                                                  1226

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Met Asp Phe Asp Glu Glu Leu Asn Leu Cys Ile Thr Lys Gly Lys Asn
1               5                   10                  15

Val Asp His Ser Phe Gly Gly Glu Ala Ser Ser Thr Ser Pro Arg Ser
            20                  25                  30

Met Lys Lys Met Lys Ser Pro Ser Arg Pro Lys Pro Tyr Phe Gln Ser
        35                  40                  45

Ser Ser Ser Pro Tyr Ser Leu Glu Ala Phe Pro Phe Ser Leu Asp Pro
    50                  55                  60

Thr Leu Gln Asn Gln Gln Gln Gln Leu Gly Ser Tyr Val Pro Val Leu
65                  70                  75                  80

Glu Gln Arg Gln Asp Pro Thr Met Gln Gly Gln Lys Gln Met Ile Ser
                85                  90                  95
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Phe Ser Pro Gln Gln Gln Gln Gln Gln Gln Tyr Met Ala Gln Tyr
100 105 110

Trp Ser Asp Thr Leu Asn Leu Ser Pro Arg Gly Arg Met Met Met Met
115 120 125

Met Ser Gln Glu Ala Val Gln Pro Tyr Ile Ala Thr Lys Leu Tyr Arg
130 135 140

Gly Val Arg Gln Arg Gln Trp Gly Lys Trp Val Ala Glu Ile Arg Lys
145 150 155 160

Pro Arg Ser Arg Ala Arg Leu Trp Leu Gly Thr Phe Asp Thr Ala Glu
165 170 175

Glu Ala Ala Met Ala Tyr Asp Arg Gln Ala Phe Lys Leu Arg Gly His
180 185 190

Ser Ala Thr Leu Asn Phe Pro Glu His Phe Val Asn Lys Glu Ser Glu
195 200 205

Leu His Asp Ser Asn Ser Ser Asp Gln Lys Glu Pro Glu Thr Pro Gln
210 215 220

Pro Ser Glu Val Asn Leu Glu Ser Lys Glu Leu Pro Val Ile Asp Val
225 230 235 240

Gly Arg Glu Glu Gly Met Ala Glu Ala Trp Tyr Asn Ala Ile Thr Ser
245 250 255

Gly Trp Gly Pro Glu Ser Pro Leu Trp Asp Asp Leu Asp Ser Ser His
260 265 270

Gln Phe Ser Ser Glu Ser Ser Ser Ser Ser Pro Leu Ser Cys Pro Met
275 280 285

Arg Pro Phe Phe
290

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cacagccaat aatgtttctc tgagggacct tgcttctgtc agagactcgc tctctctctc    120

ctcttcttgc tctgctcagc tctctcacca actcatcttc agtcctcaaa caaacatctg    180

ttctcatctt tgttttcttt cctttctttc tcatatctca ttttcaattt tcccaatttc    240

tcttcaacat cttcatagca atttaagacc actattccat tataaagcta actgctttag    300

aaactcctca catttatttc ttccccatca ttgttttaga gagggagaaa gaaaaagagc    360

tcagctttct g atg gag agg agt att caa gga caa aac aag ctc tgt tgt     410
             Met Glu Arg Ser Ile Gln Gly Gln Asn Lys Leu Cys Cys
             1               5                   10

ttg gac caa aaa gtg aat gtg aga aga agc cta caa gtt caa gaa act      458
Leu Asp Gln Lys Val Asn Val Arg Arg Ser Leu Gln Val Gln Glu Thr
    15                  20                  25

gta gag gat cat caa agc ttt gcc ctt gaa gag gaa gaa caa caa ctc      506
Val Glu Asp His Gln Ser Phe Ala Leu Glu Glu Glu Glu Gln Gln Leu
30                  35                  40                  45

tca act ccg agc ttg ctg caa gac aca aca ata cca ttt cta caa atg      554
Ser Thr Pro Ser Leu Leu Gln Asp Thr Thr Ile Pro Phe Leu Gln Met
                50                  55                  60

ctg caa caa agt gaa gac cct tca ccg ttt ttg tca ttc aaa gac cca      602
Leu Gln Gln Ser Glu Asp Pro Ser Pro Phe Leu Ser Phe Lys Asp Pro
            65                  70                  75

agc ttt cta gca cta cta tct ctc cag aca ctt gaa aag cct tgg gaa      650
Ser Phe Leu Ala Leu Leu Ser Leu Gln Thr Leu Glu Lys Pro Trp Glu
        80                  85                  90

ctc gaa aac tac ctc cca cat gaa gtt cca gag ttt cat tca ccg atc      698
Leu Glu Asn Tyr Leu Pro His Glu Val Pro Glu Phe His Ser Pro Ile
    95                  100                 105

cat tct gaa acc aac cac tac tat cat aat cca tct ttg gaa gga gtc      746
His Ser Glu Thr Asn His Tyr Tyr His Asn Pro Ser Leu Glu Gly Val
110                 115                 120                 125

aat gaa gcc atc tca aac caa gaa ctt cca ttc aac cca cta gag aat      794
Asn Glu Ala Ile Ser Asn Gln Glu Leu Pro Phe Asn Pro Leu Glu Asn
                130                 135                 140

gcg cgt tca aga cgc aag cgg aaa aac aac aac ttg gca tca ttg atg      842
Ala Arg Ser Arg Arg Lys Arg Lys Asn Asn Asn Leu Ala Ser Leu Met
            145                 150                 155

aca aga gaa aag cga aag aga aga aga act aaa cca aca aag aac ata      890
Thr Arg Glu Lys Arg Lys Arg Arg Arg Thr Lys Pro Thr Lys Asn Ile
        160                 165                 170
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gaa gag ata gag agt caa aga atg aca cac att gcg gtt gaa cga aac      938
Glu Glu Ile Glu Ser Gln Arg Met Thr His Ile Ala Val Glu Arg Asn
    175                 180                 185

cgc aga cgc caa atg aac gtt cat ctg aac tca ctc cgc tcc atc att      986
Arg Arg Arg Gln Met Asn Val His Leu Asn Ser Leu Arg Ser Ile Ile
190                 195                 200                 205

cca tct tca tac atc cag agg gga gac caa gcg tca ata gta gga gga     1034
Pro Ser Ser Tyr Ile Gln Arg Gly Asp Gln Ala Ser Ile Val Gly Gly
                210                 215                 220

gca ata gac ttc gta aag atc cta gag caa cag ttg caa tcc ctt gaa     1082
Ala Ile Asp Phe Val Lys Ile Leu Glu Gln Gln Leu Gln Ser Leu Glu
            225                 230                 235

gca caa aag aga agt caa cag agt gat gat aac aaa gag caa att cca     1130
Ala Gln Lys Arg Ser Gln Gln Ser Asp Asp Asn Lys Glu Gln Ile Pro
        240                 245                 250

gaa gat aac agt ctc agg aac att tcg tcg aac aag ttg cgt gcg agt     1178
Glu Asp Asn Ser Leu Arg Asn Ile Ser Ser Asn Lys Leu Arg Ala Ser
    255                 260                 265

aat aaa gaa gaa caa agt agc aaa ctc aaa atc gaa gcc aca gtg ata     1226
Asn Lys Glu Glu Gln Ser Ser Lys Leu Lys Ile Glu Ala Thr Val Ile
270                 275                 280                 285

gag agt cac gtc aac cta aaa att caa tgt acg agg aaa caa gga caa     1274
Glu Ser His Val Asn Leu Lys Ile Gln Cys Thr Arg Lys Gln Gly Gln
                290                 295                 300

ctt ctc aga tca atc ata ttg ctg gag aaa ctt cga ttc act gtt ctt     1322
Leu Leu Arg Ser Ile Ile Leu Leu Glu Lys Leu Arg Phe Thr Val Leu
            305                 310                 315

cat ctc aac atc aca tct ccg acc aat aca tct gtc tct tat tcc ttc     1370
His Leu Asn Ile Thr Ser Pro Thr Asn Thr Ser Val Ser Tyr Ser Phe
        320                 325                 330

aac ctc aag atg gaa gat gaa tgt aat ttg gga tca gcg gat gag ata     1418
Asn Leu Lys Met Glu Asp Glu Cys Asn Leu Gly Ser Ala Asp Glu Ile
    335                 340                 345

acg gcg gcg att cgt cag att ttc gac agc tga ttgactaatc caagtaaaaa   1471
Thr Ala Ala Ile Arg Gln Ile Phe Asp Ser
350                 355

gtaaaataaa aaaagaaacg tttactttgg taacttcgtt ttcatgatta aattctttat   1531

ttggtcgtat gtgattggag tcttctcggc atggaacttg actttggttt tagggtacta   1591

gtctctacag aagctgtggt ccttctttgg atgc                              1625

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Met Glu Arg Ser Ile Gln Gly Gln Asn Lys Leu Cys Cys Leu Asp Gln
1 5 10 15

Lys Val Asn Val Arg Arg Ser Leu Gln Val Gln Glu Thr Val Glu Asp
20 25 30

His Gln Ser Phe Ala Leu Glu Glu Glu Glu Gln Gln Leu Ser Thr Pro
35 40 45

Ser Leu Leu Gln Asp Thr Thr Ile Pro Phe Leu Gln Met Leu Gln Gln
50 55 60

Ser Glu Asp Pro Ser Pro Phe Leu Ser Phe Lys Asp Pro Ser Phe Leu
65 70 75 80

Ala Leu Leu Ser Leu Gln Thr Leu Glu Lys Pro Trp Glu Leu Glu Asn
85 90 95

Tyr Leu Pro His Glu Val Pro Glu Phe His Ser Pro Ile His Ser Glu
100 105 110

Thr Asn His Tyr Tyr His Asn Pro Ser Leu Glu Gly Val Asn Glu Ala
115 120 125

Ile Ser Asn Gln Glu Leu Pro Phe Asn Pro Leu Glu Asn Ala Arg Ser
130 135 140

Arg Arg Lys Arg Lys Asn Asn Asn Leu Ala Ser Leu Met Thr Arg Glu
145 150 155 160

Lys Arg Lys Arg Arg Arg Thr Lys Pro Thr Lys Asn Ile Glu Glu Ile
165 170 175

Glu Ser Gln Arg Met Thr His Ile Ala Val Glu Arg Asn Arg Arg Arg
180 185 190

Gln Met Asn Val His Leu Asn Ser Leu Arg Ser Ile Ile Pro Ser Ser
195 200 205

Tyr Ile Gln Arg Gly Asp Gln Ala Ser Ile Val Gly Gly Ala Ile Asp
210 215 220

Phe Val Lys Ile Leu Glu Gln Gln Leu Gln Ser Leu Glu Ala Gln Lys

```
225                 230                 235                 240

Arg Ser Gln Gln Ser Asp Asp Asn Lys Glu Gln Ile Pro Glu Asp Asn
                245                 250                 255

Ser Leu Arg Asn Ile Ser Ser Asn Lys Leu Arg Ala Ser Asn Lys Glu
            260                 265                 270

Glu Gln Ser Ser Lys Leu Lys Ile Glu Ala Thr Val Ile Glu Ser His
        275                 280                 285

Val Asn Leu Lys Ile Gln Cys Thr Arg Lys Gln Gly Gln Leu Leu Arg
    290                 295                 300

Ser Ile Ile Leu Leu Glu Lys Leu Arg Phe Thr Val Leu His Leu Asn
305                 310                 315                 320

Ile Thr Ser Pro Thr Asn Thr Ser Val Ser Tyr Ser Phe Asn Leu Lys
                325                 330                 335

Met Glu Asp Glu Cys Asn Leu Gly Ser Ala Asp Glu Ile Thr Ala Ala
            340                 345                 350

Ile Arg Gln Ile Phe Asp Ser
        355
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Replacement Sheet

<210> 335 <211> 839 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (68)..(622) <223> G1379

<400> 335

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atcctcc atg gaa ggc ggc gga gtt gct gac gtg gct gtc ccc ggt acg      109
       Met Glu Gly Gly Gly Val Ala Asp Val Ala Val Pro Gly Thr
       1               5                   10

agg aag aga gac aga cct tac aaa gga att agg atg agg aag tgg gga      157
Arg Lys Arg Asp Arg Pro Tyr Lys Gly Ile Arg Met Arg Lys Trp Gly
15                 20                  25                  30

aag tgg gtg gcg gag att cgt gag cct aac aag cgc tct agg tta tgg      205
Lys Trp Val Ala Glu Ile Arg Glu Pro Asn Lys Arg Ser Arg Leu Trp
                35                  40                  45

ctt ggc tct tac tct act ccc gag gcg gcg gcg cga gct tac gac acg      253
Leu Gly Ser Tyr Ser Thr Pro Glu Ala Ala Ala Arg Ala Tyr Asp Thr
            50                  55                  60
```

```
gcg gtt ttc tat ctt aga gga cct acg gcg agg ctt aac ttc cct gag      301
Ala Val Phe Tyr Leu Arg Gly Pro Thr Ala Arg Leu Asn Phe Pro Glu
        65                  70                  75

ctt ctt cct ggg gag aaa ttc tcc gac gag gat atg tcg gct gcg acc      349
Leu Leu Pro Gly Glu Lys Phe Ser Asp Glu Asp Met Ser Ala Ala Thr
    80                  85                  90

atc agg aag aaa gcc acg gag gtc ggt gct cag gtt gat gct ttg ggc      397
Ile Arg Lys Lys Ala Thr Glu Val Gly Ala Gln Val Asp Ala Leu Gly
95                  100                 105                 110

acg gcg gtg caa aat aac cgc cac cgt gtt ttt ggt cag aat cga gat      445
Thr Ala Val Gln Asn Asn Arg His Arg Val Phe Gly Gln Asn Arg Asp
                115                 120                 125

agt gat gtg gat aat aag aat ttt cat cgg aat tat caa aac ggt gaa      493
Ser Asp Val Asp Asn Lys Asn Phe His Arg Asn Tyr Gln Asn Gly Glu
            130                 135                 140

cga gaa gaa gaa gaa gaa gat gag gat gac aag aga ttg agg agt ggc      541
Arg Glu Glu Glu Glu Glu Asp Glu Asp Asp Lys Arg Leu Arg Ser Gly
        145                 150                 155

ggc cgg tta ttg gat cgg gtt gac ttg aat aaa tta ccc gac ccg gaa      589
Gly Arg Leu Leu Asp Arg Val Asp Leu Asn Lys Leu Pro Asp Pro Glu
    160                 165                 170

agc tcc gat gaa gaa tgg gaa agc aaa cat taa aaatatatag tttggagcgg    642
Ser Ser Asp Glu Glu Trp Glu Ser Lys His
175                 180

tggctgttgc taacgtacgc caacggcttg cttctacgaa tcattagcgc cgtttatgat    702

ttttttttt ttttttttca ttatctgaaa atttagggct ttttagttat taatttttgt    762

tttgtttttt tcctttcttg cgagttttgc ggtttatgga attttaggct attgcttaac    822

gaaaaaaaaa aaaaaaa                                                  839


<210>  336 <211>  184 <212>  PRT <213>  Arabidopsis thaliana  <400>  336

Met Glu Gly Gly Gly Val Ala Asp Val Ala Val Pro Gly Thr Arg Lys
1               5                   10                  15

Arg Asp Arg Pro Tyr Lys Gly Ile Arg Met Arg Lys Trp Gly Lys Trp
            20                  25                  30

Val Ala Glu Ile Arg Glu Pro Asn Lys Arg Ser Arg Leu Trp Leu Gly
        35                  40                  45

Ser Tyr Ser Thr Pro Glu Ala Ala Ala Arg Ala Tyr Asp Thr Ala Val
    50                  55                  60
```

Phe Tyr Leu Arg Gly Pro Thr Ala Arg Leu Asn Phe Pro Glu Leu Leu
65 70 75 80

Pro Gly Glu Lys Phe Ser Asp Glu Asp Met Ser Ala Ala Thr Ile Arg
85 90 95

Lys Lys Ala Thr Glu Val Gly Ala Gln Val Asp Ala Leu Gly Thr Ala
100 105 110

Val Gln Asn Asn Arg His Arg Val Phe Gly Gln Asn Arg Asp Ser Asp
115 120 125

Val Asp Asn Lys Asn Phe His Arg Asn Tyr Gln Asn Gly Glu Arg Glu
130 135 140

Glu Glu Glu Glu Asp Glu Asp Asp Lys Arg Leu Arg Ser Gly Gly Arg
145 150 155 160

Leu Leu Asp Arg Val Asp Leu Asn Lys Leu Pro Asp Pro Glu Ser Ser
165 170 175

Asp Glu Glu Trp Glu Ser Lys His
180

<210> 337 <211> 1258 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (69)..(1079) <223> G1385

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tcttctct atg gct act gct aag aac aag gga aaa tca atc agg gtc ctt 110
Met Ala Thr Ala Lys Asn Lys Gly Lys Ser Ile Arg Val Leu
1 5 10

ggt acc agt gaa gca gag aaa aag gat gag atg gag ttg gag gag gag 158
Gly Thr Ser Glu Ala Glu Lys Lys Asp Glu Met Glu Leu Glu Glu Glu
15 20 25 30

ttc cag ttt agt agc ggc aag tat aaa gat tcg ggt cct ggc tcg gac 206
Phe Gln Phe Ser Ser Gly Lys Tyr Lys Asp Ser Gly Pro Gly Ser Asp
35 40 45

atg tgg tta gga gat gct tcc tct acg tct cca aga agt ctt agg aag 254
Met Trp Leu Gly Asp Ala Ser Ser Thr Ser Pro Arg Ser Leu Arg Lys
50 55 60

act aga acc ttt gac cga cat aat ccc tat ctc gta tct tct tat gct 302

```
Thr Arg Thr Phe Asp Arg His Asn Pro Tyr Leu Val Ser Ser Tyr Ala
        65                  70                  75

act cct cag ccg cca aca aca act aca tgc tct gtc tct ttt ccc ttt      350
Thr Pro Gln Pro Pro Thr Thr Thr Thr Cys Ser Val Ser Phe Pro Phe
    80                  85                  90

tac ctc cct cca gcg att caa aat caa caa cga ttt tta cac ccg aat      398
Tyr Leu Pro Pro Ala Ile Gln Asn Gln Gln Arg Phe Leu His Pro Asn
95                  100                 105                 110

gac cct tca gga caa aga cag caa caa atg atc tcg ttt gat cct caa      446
Asp Pro Ser Gly Gln Arg Gln Gln Gln Met Ile Ser Phe Asp Pro Gln
                115                 120                 125

caa cag gtg caa cca tat gtt gca caa cag cag caa caa caa caa cat      494
Gln Gln Val Gln Pro Tyr Val Ala Gln Gln Gln Gln Gln Gln Gln His
            130                 135                 140

cta ttg cag tac tgg aga gac att ctg aag ctg agt ccg agc gga aga      542
Leu Leu Gln Tyr Trp Arg Asp Ile Leu Lys Leu Ser Pro Ser Gly Arg
        145                 150                 155

atg atg atg atg aac atg tta aga caa gaa agc gat ctg cca ctg acg      590
Met Met Met Met Asn Met Leu Arg Gln Glu Ser Asp Leu Pro Leu Thr
    160                 165                 170

agg cca ccg gtt caa ccc ttc agc gcc acc aag cta tat aga ggt gtc      638
Arg Pro Pro Val Gln Pro Phe Ser Ala Thr Lys Leu Tyr Arg Gly Val
175                 180                 185                 190

agg caa cgc cac tgg gga aaa tgg gtt gcc gag atc cgt aag cca cga      686
Arg Gln Arg His Trp Gly Lys Trp Val Ala Glu Ile Arg Lys Pro Arg
                195                 200                 205

aac agg aca cgt ctc tgg cta ggg aca ttc gat aca gca gaa gaa gcc      734
Asn Arg Thr Arg Leu Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala
            210                 215                 220

gcc atg gcc tac gac cgc gag gcc ttc aag ttg agg gga gag acc gct      782
Ala Met Ala Tyr Asp Arg Glu Ala Phe Lys Leu Arg Gly Glu Thr Ala
        225                 230                 235

agg ctc aat ttc cct gaa ctt ttt ctc aat aaa caa gag cca act ccc      830
Arg Leu Asn Phe Pro Glu Leu Phe Leu Asn Lys Gln Glu Pro Thr Pro
    240                 245                 250

gtg cat cag aaa caa tgt gag acg ggg act act agt gaa gac tca agc      878
Val His Gln Lys Gln Cys Glu Thr Gly Thr Thr Ser Glu Asp Ser Ser
255                 260                 265                 270

aga aga gga gag gat gat tcg agc acg gca ttg gca gta gga ggg gtg      926
Arg Arg Gly Glu Asp Asp Ser Ser Thr Ala Leu Ala Val Gly Gly Val
                275                 280                 285

agt gag gag acg ggt tgg gct gag gca tgg ttc aat gca att cca gag      974
Ser Glu Glu Thr Gly Trp Ala Glu Ala Trp Phe Asn Ala Ile Pro Glu
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            290                 295                 300

gaa tgg gga cct gga agc cct cta tgg gat gat tac cac ttt ccc att     1022
Glu Trp Gly Pro Gly Ser Pro Leu Trp Asp Asp Tyr His Phe Pro Ile
        305                 310                 315

tct aac cat aag gac gat ctt gac gcc aca caa aac tct tct tct gat     1070
Ser Asn His Lys Asp Asp Leu Asp Ala Thr Gln Asn Ser Ser Ser Asp
    320                 325                 330

aca att tag gacctttgtt agaatataga tatgcttagt tgtatgactg             1119
Thr Ile
335

atctagcttg tgtttttttt ttgggtggag acagtttttg tcatcttcca cattttagat   1179

tctattttcg accatcattt ttttcttgat cggtgactat gaatctaatg gggtcaatca   1239

ttttcacata taaaactta                                               1258


<210>  338 <211>  336 <212>  PRT <213>  Arabidopsis thaliana  <400>  338

Met Ala Thr Ala Lys Asn Lys Gly Lys Ser Ile Arg Val Leu Gly Thr
1               5                   10                  15

Ser Glu Ala Glu Lys Lys Asp Glu Met Glu Leu Glu Glu Glu Phe Gln
            20                  25                  30

Phe Ser Ser Gly Lys Tyr Lys Asp Ser Gly Pro Gly Ser Asp Met Trp
        35                  40                  45

Leu Gly Asp Ala Ser Ser Thr Ser Pro Arg Ser Leu Arg Lys Thr Arg
    50                  55                  60

Thr Phe Asp Arg His Asn Pro Tyr Leu Val Ser Ser Tyr Ala Thr Pro
65                  70                  75                  80

Gln Pro Pro Thr Thr Thr Thr Cys Ser Val Ser Phe Pro Phe Tyr Leu
                85                  90                  95

Pro Pro Ala Ile Gln Asn Gln Gln Arg Phe Leu His Pro Asn Asp Pro
            100                 105                 110

Ser Gly Gln Arg Gln Gln Gln Met Ile Ser Phe Asp Pro Gln Gln Gln
        115                 120                 125

Val Gln Pro Tyr Val Ala Gln Gln Gln Gln Gln Gln His Leu Leu
    130                 135                 140
```

Gln Tyr Trp Arg Asp Ile Leu Lys Leu Ser Pro Ser Gly Arg Met Met
145 150 155 160

Met Met Asn Met Leu Arg Gln Glu Ser Asp Leu Pro Leu Thr Arg Pro
165 170 175

Pro Val Gln Pro Phe Ser Ala Thr Lys Leu Tyr Arg Gly Val Arg Gln
180 185 190

Arg His Trp Gly Lys Trp Val Ala Glu Ile Arg Lys Pro Arg Asn Arg
195 200 205

Thr Arg Leu Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala Ala Met
210 215 220

Ala Tyr Asp Arg Glu Ala Phe Lys Leu Arg Gly Glu Thr Ala Arg Leu
225 230 235 240

Asn Phe Pro Glu Leu Phe Leu Asn Lys Gln Glu Pro Thr Pro Val His
245 250 255

Gln Lys Gln Cys Glu Thr Gly Thr Thr Ser Glu Asp Ser Ser Arg Arg
260 265 270

Gly Glu Asp Asp Ser Ser Thr Ala Leu Ala Val Gly Gly Val Ser Glu
275 280 285

Glu Thr Gly Trp Ala Glu Ala Trp Phe Asn Ala Ile Pro Glu Glu Trp
290 295 300

Gly Pro Gly Ser Pro Leu Trp Asp Asp Tyr His Phe Pro Ile Ser Asn
305 310 315 320

His Lys Asp Asp Leu Asp Ala Thr Gln Asn Ser Ser Ser Asp Thr Ile
325 330 335

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<222> (1)..(942) <223> G1847

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Met Glu Met Met Asn Trp Glu Arg Arg Ser Leu Leu Asn Glu Leu Ile
1 5 10 15

```
cat gga cta aaa gcg gcc aag cag ctt cag ggt tcg tct tct cca tcg       96
His Gly Leu Lys Ala Ala Lys Gln Leu Gln Gly Ser Ser Ser Pro Ser
            20                  25                  30

ttg tca gct tct tct tca tat ttg acg acg gag ata aag gag aat ctc      144
Leu Ser Ala Ser Ser Ser Tyr Leu Thr Thr Glu Ile Lys Glu Asn Leu
        35                  40                  45

tta cat aac ata gtt tct tcc ttc aaa aaa gct att ttg atg ctc aac      192
Leu His Asn Ile Val Ser Ser Phe Lys Lys Ala Ile Leu Met Leu Asn
    50                  55                  60

gga tcc acc aca caa cac aat cca acg ata gag ctt gcg cct gat ccc      240
Gly Ser Thr Thr Gln His Asn Pro Thr Ile Glu Leu Ala Pro Asp Pro
65                  70                  75                  80

cta gct cat ccc gga aag gtt cca gga tct cca gca tcg atc acc gga      288
Leu Ala His Pro Gly Lys Val Pro Gly Ser Pro Ala Ser Ile Thr Gly
                85                  90                  95

aat ccg aga agc gaa gag ttt ttc aat gta aga tcg aaa gaa ttc aac      336
Asn Pro Arg Ser Glu Glu Phe Phe Asn Val Arg Ser Lys Glu Phe Asn
            100                 105                 110

tta agt tct aaa aag agg aag atg ttg cca aag tgg aca gag caa gtg      384
Leu Ser Ser Lys Lys Arg Lys Met Leu Pro Lys Trp Thr Glu Gln Val
        115                 120                 125

aga att agc cca gag aga ggc tta gaa gga cct cat gac gat atc ttc      432
Arg Ile Ser Pro Glu Arg Gly Leu Glu Gly Pro His Asp Asp Ile Phe
    130                 135                 140

agc tgg aga aaa tat ggc cag aaa gac att ttg ggc gcc aaa ttc cca      480
Ser Trp Arg Lys Tyr Gly Gln Lys Asp Ile Leu Gly Ala Lys Phe Pro
145                 150                 155                 160

agg agt tat tac aga tgc aca ttt cgt aac aca cag tac tgt tgg gct      528
Arg Ser Tyr Tyr Arg Cys Thr Phe Arg Asn Thr Gln Tyr Cys Trp Ala
                165                 170                 175

acg aaa caa gtc caa aga tcg gac ggt gat cca acg atc ttc gaa gta      576
Thr Lys Gln Val Gln Arg Ser Asp Gly Asp Pro Thr Ile Phe Glu Val
            180                 185                 190

aca tac aga gga aca cac act tgt tca cag ggg atc cca ctt cca gag      624
Thr Tyr Arg Gly Thr His Thr Cys Ser Gln Gly Ile Pro Leu Pro Glu
        195                 200                 205

aaa cga gaa acc aaa cca aaa cac aca gta gca gta aat tac cag aat      672
Lys Arg Glu Thr Lys Pro Lys His Thr Val Ala Val Asn Tyr Gln Asn
    210                 215                 220

ctc agg gcc agt ctt acc gta cgt acc ggc gga ctt gga agc gaa gct      720
Leu Arg Ala Ser Leu Thr Val Arg Thr Gly Gly Leu Gly Ser Glu Ala
225                 230                 235                 240
```

```
ttc tca ttc ccc gtc acg tcg ccg tta tac act tac gag tcc atc aac      768
Phe Ser Phe Pro Val Thr Ser Pro Leu Tyr Thr Tyr Glu Ser Ile Asn
                245                 250                 255

ggt ggt gga acg ttt tac cac cac gtg gga agt tct ggt ccg tcg gat      816
Gly Gly Gly Thr Phe Tyr His His Val Gly Ser Ser Gly Pro Ser Asp
            260                 265                 270

ttc act gga ttg atc tca aca aat act tcc aca gga agt tct cca atc      864
Phe Thr Gly Leu Ile Ser Thr Asn Thr Ser Thr Gly Ser Ser Pro Ile
        275                 280                 285

ttc gac gtt aat ttt caa ttt gat cca acg gct gag att aac aca ggc      912
Phe Asp Val Asn Phe Gln Phe Asp Pro Thr Ala Glu Ile Asn Thr Gly
    290                 295                 300

ttc ccc act ttt ttc cac aat tcg att taa                             942
Phe Pro Thr Phe Phe His Asn Ser Ile
305                 310
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<210> 340 <211> 313 <212> PRT <213> Arabidopsis thaliana <400> 340

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Met Glu Met Met Asn Trp Glu Arg Arg Ser Leu Leu Asn Glu Leu Ile
1               5                   10                  15

His Gly Leu Lys Ala Ala Lys Gln Leu Gln Gly Ser Ser Ser Pro Ser
            20                  25                  30

Leu Ser Ala Ser Ser Ser Tyr Leu Thr Thr Glu Ile Lys Glu Asn Leu
        35                  40                  45

Leu His Asn Ile Val Ser Ser Phe Lys Lys Ala Ile Leu Met Leu Asn
    50                  55                  60

Gly Ser Thr Thr Gln His Asn Pro Thr Ile Glu Leu Ala Pro Asp Pro
65                  70                  75                  80

Leu Ala His Pro Gly Lys Val Pro Gly Ser Pro Ala Ser Ile Thr Gly
                85                  90                  95

Asn Pro Arg Ser Glu Glu Phe Phe Asn Val Arg Ser Lys Glu Phe Asn
            100                 105                 110

Leu Ser Ser Lys Lys Arg Lys Met Leu Pro Lys Trp Thr Glu Gln Val
        115                 120                 125

Arg Ile Ser Pro Glu Arg Gly Leu Glu Gly Pro His Asp Asp Ile Phe
    130                 135                 140
```

Ser Trp Arg Lys Tyr Gly Gln Lys Asp Ile Leu Gly Ala Lys Phe Pro
145 150 155 160

Arg Ser Tyr Tyr Arg Cys Thr Phe Arg Asn Thr Gln Tyr Cys Trp Ala
165 170 175

Thr Lys Gln Val Gln Arg Ser Asp Gly Asp Pro Thr Ile Phe Glu Val
180 185 190

Thr Tyr Arg Gly Thr His Thr Cys Ser Gln Gly Ile Pro Leu Pro Glu
195 200 205

Lys Arg Glu Thr Lys Pro Lys His Thr Val Ala Val Asn Tyr Gln Asn
210 215 220

Leu Arg Ala Ser Leu Thr Val Arg Thr Gly Gly Leu Gly Ser Glu Ala
225 230 235 240

Phe Ser Phe Pro Val Thr Ser Pro Leu Tyr Thr Tyr Glu Ser Ile Asn
245 250 255

Gly Gly Gly Thr Phe Tyr His His Val Gly Ser Ser Gly Pro Ser Asp
260 265 270

Phe Thr Gly Leu Ile Ser Thr Asn Thr Ser Thr Gly Ser Ser Pro Ile
275 280 285

Phe Asp Val Asn Phe Gln Phe Asp Pro Thr Ala Glu Ile Asn Thr Gly
290 295 300

Phe Pro Thr Phe Phe His Asn Ser Ile
305 310

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<222> (1)..(591) <223> G2629

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Met Asn Thr Ile Pro Ala Glu Leu Thr Gly Tyr Phe His Tyr Leu Pro
1 5 10 15

cca gat aaa tat aat aac caa aca cca atc atg gag tct gag tac ttc 96
Pro Asp Lys Tyr Asn Asn Gln Thr Pro Ile Met Glu Ser Glu Tyr Phe
20 25 30

```
aac atg ccc tct tct cct act tct tgt tcc tcc ttc tac cac ctc aat      144
Asn Met Pro Ser Ser Pro Thr Ser Cys Ser Ser Phe Tyr His Leu Asn
        35                  40                  45

ggt ctg atc aac aac aac aac tac tct tca tca tcc aat ggt cag gat      192
Gly Leu Ile Asn Asn Asn Asn Tyr Ser Ser Ser Ser Asn Gly Gln Asp
    50                  55                  60

cta atg acg agc aac aac tca act tca gac gaa gat cac caa caa agt      240
Leu Met Thr Ser Asn Asn Ser Thr Ser Asp Glu Asp His Gln Gln Ser
65                  70                  75                  80

atg gtc atc gat gag agg aaa caa agg aga atg atc tct aac agg gaa      288
Met Val Ile Asp Glu Arg Lys Gln Arg Arg Met Ile Ser Asn Arg Glu
                85                  90                  95

tct gct cgt agg tca aga atg aga aag cag aga cat ctc gat gag ctt      336
Ser Ala Arg Arg Ser Arg Met Arg Lys Gln Arg His Leu Asp Glu Leu
            100                 105                 110

tgg tct caa gtg ata aga ctt cgc act gat aac cac tgt ctt atg gat      384
Trp Ser Gln Val Ile Arg Leu Arg Thr Asp Asn His Cys Leu Met Asp
        115                 120                 125

aag ctg aac cgc gta tct gaa agc cat gag ctt gct tta aag gag aac      432
Lys Leu Asn Arg Val Ser Glu Ser His Glu Leu Ala Leu Lys Glu Asn
    130                 135                 140

gct aag ctt aaa gag gaa act tct gat ctc aga cag ctg atc tct gag      480
Ala Lys Leu Lys Glu Glu Thr Ser Asp Leu Arg Gln Leu Ile Ser Glu
145                 150                 155                 160

ata aag tca cac aac gaa gac gac aac agt ttt tta aga gag ctc gaa      528
Ile Lys Ser His Asn Glu Asp Asp Asn Ser Phe Leu Arg Glu Leu Glu
                165                 170                 175

gat tcg ata tca aac tct aga tcg gat tcg aac caa agc ggc aga gat      576
Asp Ser Ile Ser Asn Ser Arg Ser Asp Ser Asn Gln Ser Gly Arg Asp
            180                 185                 190

ttt gag ttg tgt taa                                                 591
Phe Glu Leu Cys
        195
```

<210> 342 <211> 196 <212> PRT <213> Arabidopsis thaliana <400> 342

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Met Asn Thr Ile Pro Ala Glu Leu Thr Gly Tyr Phe His Tyr Leu Pro
1               5                   10                  15

Pro Asp Lys Tyr Asn Asn Gln Thr Pro Ile Met Glu Ser Glu Tyr Phe
            20                  25                  30

Asn Met Pro Ser Ser Pro Thr Ser Cys Ser Ser Phe Tyr His Leu Asn
```

```
        35                  40                  45

Gly Leu Ile Asn Asn Asn Asn Tyr Ser Ser Ser Ser Asn Gly Gln Asp
    50                  55                  60

Leu Met Thr Ser Asn Asn Ser Thr Ser Asp Glu Asp His Gln Gln Ser
65                  70                  75                  80

Met Val Ile Asp Glu Arg Lys Gln Arg Arg Met Ile Ser Asn Arg Glu
                85                  90                  95

Ser Ala Arg Arg Ser Arg Met Arg Lys Gln Arg His Leu Asp Glu Leu
            100                 105                 110

Trp Ser Gln Val Ile Arg Leu Arg Thr Asp Asn His Cys Leu Met Asp
        115                 120                 125

Lys Leu Asn Arg Val Ser Glu Ser His Glu Leu Ala Leu Lys Glu Asn
    130                 135                 140

Ala Lys Leu Lys Glu Glu Thr Ser Asp Leu Arg Gln Leu Ile Ser Glu
145                 150                 155                 160

Ile Lys Ser His Asn Glu Asp Asp Asn Ser Phe Leu Arg Glu Leu Glu
                165                 170                 175

Asp Ser Ile Ser Asn Ser Arg Ser Asp Ser Asn Gln Ser Gly Arg Asp
            180                 185                 190

Phe Glu Leu Cys
        195
```

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<222> (14)..(682) <223> G6

<400> 343

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               Met Ala Lys Met Gly Leu Lys Pro Asp Pro Ala Thr
               1               5                   10

act aac cag acc cac aat aat gcc aag gag att cgt tac aga ggc gtt       97
Thr Asn Gln Thr His Asn Asn Ala Lys Glu Ile Arg Tyr Arg Gly Val
        15                  20                  25

agg aag cgt cct tgg ggc cgt tat gcc gcc gag atc cga gat ccg ggc      145
Arg Lys Arg Pro Trp Gly Arg Tyr Ala Ala Glu Ile Arg Asp Pro Gly
```

```
    30                  35                  40

aag aaa acc cgc gtc tgg ctt ggc act ttc gat acg gct gaa gag gcg      193
Lys Lys Thr Arg Val Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala
45                  50                  55                  60

gcg cgt gct tac gat acg gcg gcg cgt gat ttt cgt ggt gct aag gct      241
Ala Arg Ala Tyr Asp Thr Ala Ala Arg Asp Phe Arg Gly Ala Lys Ala
                65                  70                  75

aag acc aat ttc cca act ttt ctc gag ctg agt gac cag aag gtc cct      289
Lys Thr Asn Phe Pro Thr Phe Leu Glu Leu Ser Asp Gln Lys Val Pro
            80                  85                  90

acc ggt ttc gcg cgt agc cct agc cag agc agc acg ctc gac tgt gct      337
Thr Gly Phe Ala Arg Ser Pro Ser Gln Ser Ser Thr Leu Asp Cys Ala
        95                  100                 105

tct cct ccg acg tta gtt gtg cct tca gcg acg gct ggg aat gtt ccc      385
Ser Pro Pro Thr Leu Val Val Pro Ser Ala Thr Ala Gly Asn Val Pro
    110                 115                 120

ccg cag ctc gag ctt agt ctc ggc gga gga ggc ggc ggc tcg tgt tat      433
Pro Gln Leu Glu Leu Ser Leu Gly Gly Gly Gly Gly Gly Ser Cys Tyr
125                 130                 135                 140

cag atc ccg atg tcg cgt cct gtc tac ttt ttg gac ctg atg ggg atc      481
Gln Ile Pro Met Ser Arg Pro Val Tyr Phe Leu Asp Leu Met Gly Ile
                145                 150                 155

ggt aac gta ggt cgt ggt cag cct cct cct gtg aca tcg gcg ttt aga      529
Gly Asn Val Gly Arg Gly Gln Pro Pro Pro Val Thr Ser Ala Phe Arg
            160                 165                 170

tcg ccg gtg gtg cat gtt gcg acg aag atg gct tgt ggt gcc caa agc      577
Ser Pro Val Val His Val Ala Thr Lys Met Ala Cys Gly Ala Gln Ser
        175                 180                 185

gac tct gat tcg tca tcg gtc gtt gat ttc gaa ggt ggg atg gag aag      625
Asp Ser Asp Ser Ser Ser Val Val Asp Phe Glu Gly Gly Met Glu Lys
    190                 195                 200

aga tct cag ctg tta gat cta gat ctt aat ttg cct cct cca tcg gaa      673
Arg Ser Gln Leu Leu Asp Leu Asp Leu Asn Leu Pro Pro Pro Ser Glu
205                 210                 215                 220

cag gcc tga gcttttaacg gtgtcgtttc aattcgaagc gcatgcgttt              722
Gln Ala

cttcttcttt ttgagctgtg aaaattcgtt ttctcatagt ttttcctctc tctctctctc    782

agtctaaatt tattaccagt ttttagaaag aaaaaacaga ttaaatctga gagagaaaaa    842

tataatttta gctgacatgg atcgttatgt acatattatt acataaccgg agatctgaac    902

ttttgttgtg tgcttttaat tttttgcgac ttggtttcac cccatgttgt ttctctattt    962
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ttttactac ttttttttt tttgttcttc caaattttca atcaataatt tggtaatctt 1022

c 1023

<210> 344 <211> 222 <212> PRT <213> Arabidopsis thaliana <400> 344

Met Ala Lys Met Gly Leu Lys Pro Asp Pro Ala Thr Thr Asn Gln Thr
1 5 10 15

His Asn Asn Ala Lys Glu Ile Arg Tyr Arg Gly Val Arg Lys Arg Pro
20 25 30

Trp Gly Arg Tyr Ala Ala Glu Ile Arg Asp Pro Gly Lys Lys Thr Arg
35 40 45

Val Trp Leu Gly Thr Phe Asp Thr Ala Glu Glu Ala Ala Arg Ala Tyr
50 55 60

Asp Thr Ala Ala Arg Asp Phe Arg Gly Ala Lys Ala Lys Thr Asn Phe
65 70 75 80

Pro Thr Phe Leu Glu Leu Ser Asp Gln Lys Val Pro Thr Gly Phe Ala
85 90 95

Arg Ser Pro Ser Gln Ser Ser Thr Leu Asp Cys Ala Ser Pro Pro Thr
100 105 110

Leu Val Val Pro Ser Ala Thr Ala Gly Asn Val Pro Pro Gln Leu Glu
115 120 125

Leu Ser Leu Gly Gly Gly Gly Gly Gly Ser Cys Tyr Gln Ile Pro Met
130 135 140

Ser Arg Pro Val Tyr Phe Leu Asp Leu Met Gly Ile Gly Asn Val Gly
145 150 155 160

Arg Gly Gln Pro Pro Pro Val Thr Ser Ala Phe Arg Ser Pro Val Val
165 170 175

His Val Ala Thr Lys Met Ala Cys Gly Ala Gln Ser Asp Ser Asp Ser
180 185 190

Ser Ser Val Val Asp Phe Glu Gly Gly Met Glu Lys Arg Ser Gln Leu

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        195                 200                 205

Leu Asp Leu Asp Leu Asn Leu Pro Pro Pro Ser Glu Gln Ala
    210                 215                 220


<210>  345 <211>  1246 <212>  DNA <213>  Arabidopsis thaliana  <220> <221>  CDS
<222>  (81)..(1139) <223>  G9

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gtgtttcttc tttctgctaa aaggttataa tttttgtttc ttggtttggt gagaatcttc     60

aagaaactga aacaaagaaa atg gat tct agt tgc ata gac gag ata agt tcc    113
                       Met Asp Ser Ser Cys Ile Asp Glu Ile Ser Ser
                       1               5                   10

tcc act tca gaa tct ttc tcc gcc acc acc gcc aag aag ctc tct cct      161
Ser Thr Ser Glu Ser Phe Ser Ala Thr Thr Ala Lys Lys Leu Ser Pro
            15                  20                  25

cct ccc gcg gcg gcg tta cgc ctc tac cgg atg gga agc ggc ggg agc      209
Pro Pro Ala Ala Ala Leu Arg Leu Tyr Arg Met Gly Ser Gly Gly Ser
        30                  35                  40

agc gtc gtg ttg gat ccc gag aac ggc cta gag acg gag tca cga aag      257
Ser Val Val Leu Asp Pro Glu Asn Gly Leu Glu Thr Glu Ser Arg Lys
    45                  50                  55

cta cca tct tca aaa tac aaa ggt gtt gtt cct cag cct aac gga aga      305
Leu Pro Ser Ser Lys Tyr Lys Gly Val Val Pro Gln Pro Asn Gly Arg
60                  65                  70                  75

tgg gga gct cag atc tac gag aag cac caa cga gta tgg ctc ggg act      353
Trp Gly Ala Gln Ile Tyr Glu Lys His Gln Arg Val Trp Leu Gly Thr
                80                  85                  90

ttc aac gag caa gaa gaa gct gct cgt tcc tac gac atc gca gct tgt      401
Phe Asn Glu Gln Glu Glu Ala Ala Arg Ser Tyr Asp Ile Ala Ala Cys
            95                  100                 105

aga ttc cgt ggc cgc gac gcc gtc gtc aac ttc aag aac gtt ctg gaa      449
Arg Phe Arg Gly Arg Asp Ala Val Val Asn Phe Lys Asn Val Leu Glu
        110                 115                 120

gac ggc gat tta gct ttt ctt gaa gct cac tca aag gcc gag atc gtc      497
Asp Gly Asp Leu Ala Phe Leu Glu Ala His Ser Lys Ala Glu Ile Val
    125                 130                 135

gac atg ttg aga aaa cac act tac gcc gac gag ctt gaa cag aac aat      545
Asp Met Leu Arg Lys His Thr Tyr Ala Asp Glu Leu Glu Gln Asn Asn
140                 145                 150                 155

aaa cgg cag ttg ttt ctc tcc gtc gac gct aac gga aaa cgt aac gga      593
Lys Arg Gln Leu Phe Leu Ser Val Asp Ala Asn Gly Lys Arg Asn Gly
        .       160                 165                 170
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tcg agt act act caa aac gac aaa gtt tta aag acg tgt gaa gtt ctt      641
Ser Ser Thr Thr Gln Asn Asp Lys Val Leu Lys Thr Cys Glu Val Leu
            175                 180                 185

ttc gag aag gct gtt aca cct agc gac gtt ggg aag cta aac cgt ctc      689
Phe Glu Lys Ala Val Thr Pro Ser Asp Val Gly Lys Leu Asn Arg Leu
        190                 195                 200

gtg ata cct aaa caa cac gcc gag aaa cac ttt ccg tta ccg tca ccg      737
Val Ile Pro Lys Gln His Ala Glu Lys His Phe Pro Leu Pro Ser Pro
    205                 210                 215

tca ccg gca gtg act aaa gga gtt ttg atc aac ttc gaa gac gtt aac      785
Ser Pro Ala Val Thr Lys Gly Val Leu Ile Asn Phe Glu Asp Val Asn
220                 225                 230                 235

ggt aaa gtg tgg agg ttc cgt tac tca tac tgg aac agt agt caa agt      833
Gly Lys Val Trp Arg Phe Arg Tyr Ser Tyr Trp Asn Ser Ser Gln Ser
                240                 245                 250

tac gtg ttg acc aag gga tgg agt cga ttc gtc aag gag aag aat ctt      881
Tyr Val Leu Thr Lys Gly Trp Ser Arg Phe Val Lys Glu Lys Asn Leu
            255                 260                 265

cga gcc ggt gat gtt gtt act ttc gag aga tcg acc gga cta gag cgg      929
Arg Ala Gly Asp Val Val Thr Phe Glu Arg Ser Thr Gly Leu Glu Arg
        270                 275                 280

cag tta tat att gat tgg aaa gtt cgg tct ggt ccg aga gaa aac ccg      977
Gln Leu Tyr Ile Asp Trp Lys Val Arg Ser Gly Pro Arg Glu Asn Pro
    285                 290                 295

gtt cag gtg gtg gtt cgg ctt ttc gga gtt gat atc ttt aat gtg acc     1025
Val Gln Val Val Val Arg Leu Phe Gly Val Asp Ile Phe Asn Val Thr
300                 305                 310                 315

acc gtg aag cca aac gac gtc gtg gcc gtt tgc ggt gga aag aga tct     1073
Thr Val Lys Pro Asn Asp Val Val Ala Val Cys Gly Gly Lys Arg Ser
                320                 325                 330

cga gat gtt gat gat atg ttt gcg tta cgg tgt tcc aag aag cag gcg     1121
Arg Asp Val Asp Asp Met Phe Ala Leu Arg Cys Ser Lys Lys Gln Ala
            335                 340                 345

ata atc aat gct ttg tga catatttcct tttccgattt tatgctttcg           1169
Ile Ile Asn Ala Leu
        350

ttttttaatt ttttttttg tcaagttgtg taggttgtga ttcatgctag gttgtattta   1229

ggaaaagaga taagacc                                                 1246


<210>  346 <211>  352 <212>  PRT <213>  Arabidopsis thaliana  <400>  346

Met Asp Ser Ser Cys Ile Asp Glu Ile Ser Ser Ser Thr Ser Glu Ser
1               5                   10                  15
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Phe Ser Ala Thr Thr Ala Lys Lys Leu Ser Pro Pro Pro Ala Ala Ala
20 25 30

Leu Arg Leu Tyr Arg Met Gly Ser Gly Gly Ser Ser Val Val Leu Asp
35 40 45

Pro Glu Asn Gly Leu Glu Thr Glu Ser Arg Lys Leu Pro Ser Ser Lys
50 55 60

Tyr Lys Gly Val Val Pro Gln Pro Asn Gly Arg Trp Gly Ala Gln Ile
65 70 75 80

Tyr Glu Lys His Gln Arg Val Trp Leu Gly Thr Phe Asn Glu Gln Glu
85 90 95

Glu Ala Ala Arg Ser Tyr Asp Ile Ala Ala Cys Arg Phe Arg Gly Arg
100 105 110

Asp Ala Val Val Asn Phe Lys Asn Val Leu Glu Asp Gly Asp Leu Ala
115 120 125

Phe Leu Glu Ala His Ser Lys Ala Glu Ile Val Asp Met Leu Arg Lys
130 135 140

His Thr Tyr Ala Asp Glu Leu Glu Gln Asn Asn Lys Arg Gln Leu Phe
145 150 155 160

Leu Ser Val Asp Ala Asn Gly Lys Arg Asn Gly Ser Ser Thr Thr Gln
165 170 175

Asn Asp Lys Val Leu Lys Thr Cys Glu Val Leu Phe Glu Lys Ala Val
180 185 190

Thr Pro Ser Asp Val Gly Lys Leu Asn Arg Leu Val Ile Pro Lys Gln
195 200 205

His Ala Glu Lys His Phe Pro Leu Pro Ser Pro Ser Pro Ala Val Thr
210 215 220

Lys Gly Val Leu Ile Asn Phe Glu Asp Val Asn Gly Lys Val Trp Arg
225 230 235 240

```
Phe Arg Tyr Ser Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys
                245                 250                 255

Gly Trp Ser Arg Phe Val Lys Glu Lys Asn Leu Arg Ala Gly Asp Val
            260                 265                 270

Val Thr Phe Glu Arg Ser Thr Gly Leu Glu Arg Gln Leu Tyr Ile Asp
        275                 280                 285

Trp Lys Val Arg Ser Gly Pro Arg Glu Asn Pro Val Gln Val Val Val
    290                 295                 300

Arg Leu Phe Gly Val Asp Ile Phe Asn Val Thr Thr Val Lys Pro Asn
305                 310                 315                 320

Asp Val Val Ala Val Cys Gly Gly Lys Arg Ser Arg Asp Val Asp Asp
                325                 330                 335

Met Phe Ala Leu Arg Cys Ser Lys Lys Gln Ala Ile Ile Asn Ala Leu
            340                 345                 350
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<210> 347 <211> 553 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (41)..(442) <223> G30

<400> 347

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ctcttctgac gcacaacagt atatacacat acacagatat atg gat caa gga ggt       55
                                              Met Asp Gln Gly Gly
                                              1               5

cgt agc agt ggt agt gga gga gga gga gcc gag caa ggg aag tac cgt      103
Arg Ser Ser Gly Ser Gly Gly Gly Gly Ala Glu Gln Gly Lys Tyr Arg
                10                  15                  20

gga gta agg aga cga cct tgg ggt aaa tac gcc gcg gaa ata aga gat      151
Gly Val Arg Arg Arg Pro Trp Gly Lys Tyr Ala Ala Glu Ile Arg Asp
            25                  30                  35

tcg agg aag cac gga gag cgt gtg tgg cta ggg aca ttc gac act gcg      199
Ser Arg Lys His Gly Glu Arg Val Trp Leu Gly Thr Phe Asp Thr Ala
        40                  45                  50

gaa gac gcg gct cga gcc tat gac cga gcc gcc tat tca atg aga ggc      247
Glu Asp Ala Ala Arg Ala Tyr Asp Arg Ala Ala Tyr Ser Met Arg Gly
    55                  60                  65

aaa gct gcc att ctc aac ttc cct cac gag tat aac atg gga acc gga      295
Lys Ala Ala Ile Leu Asn Phe Pro His Glu Tyr Asn Met Gly Thr Gly
70                  75                  80                  85
```

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tcc tca tcc act gcg gct aat tct tct tcc tcg tcg cag caa gtt ttt      343
Ser Ser Ser Thr Ala Ala Asn Ser Ser Ser Ser Ser Gln Gln Val Phe
                90                  95                  100

gag ttt gag tac ttg gac gat agc gtt ttg gat gaa ctt ctt gaa tat      391
Glu Phe Glu Tyr Leu Asp Asp Ser Val Leu Asp Glu Leu Leu Glu Tyr
            105                 110                 115

gga gag aac tat aac aag act cat aat atc aac atg ggc aag agg caa      439
Gly Glu Asn Tyr Asn Lys Thr His Asn Ile Asn Met Gly Lys Arg Gln
        120                 125                 130

taa agggaataca atcggtatta actgaaagtt atgtgaaaga ccattttcag           492

ttataacaaa taaaataaaa tcccaagcgt acaaagctgt ttctaaaaaa aaaaaaaaaa    552

a                                                                    553
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<210> 348 <211> 133 <212> PRT <213> Arabidopsis thaliana <400> 348

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Met Asp Gln Gly Gly Arg Ser Ser Gly Ser Gly Gly Gly Gly Ala Glu
1               5                   10                  15

Gln Gly Lys Tyr Arg Gly Val Arg Arg Arg Pro Trp Gly Lys Tyr Ala
            20                  25                  30

Ala Glu Ile Arg Asp Ser Arg Lys His Gly Glu Arg Val Trp Leu Gly
        35                  40                  45

Thr Phe Asp Thr Ala Glu Asp Ala Ala Arg Ala Tyr Asp Arg Ala Ala
    50                  55                  60

Tyr Ser Met Arg Gly Lys Ala Ala Ile Leu Asn Phe Pro His Glu Tyr
65                  70                  75                  80

Asn Met Gly Thr Gly Ser Ser Ser Thr Ala Ala Asn Ser Ser Ser Ser
                85                  90                  95

Ser Gln Gln Val Phe Glu Phe Glu Tyr Leu Asp Asp Ser Val Leu Asp
            100                 105                 110

Glu Leu Leu Glu Tyr Gly Glu Asn Tyr Asn Lys Thr His Asn Ile Asn
        115                 120                 125

Met Gly Lys Arg Gln
    130
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<210> 349 <211> 929 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (164)..(805) <223> G40

<400> 349
cttgaaaaag aatctacctg aaaagaaaaa aaagagagag agatataaat agctttacca 60

agacagatat actatctttt attaatccaa aaagactgag aactctagta actacgtact 120

acttaaacct tatccagttt cttgaaacag agtactctga tca atg aac tca ttt 175
Met Asn Ser Phe
1

tca gct ttt tct gaa atg ttt ggc tcc gat tac gag cct caa ggc gga 223
Ser Ala Phe Ser Glu Met Phe Gly Ser Asp Tyr Glu Pro Gln Gly Gly
5 10 15 20

gat tat tgt ccg acg ttg gcc acg agt tgt ccg aag aaa ccg gcg ggc 271
Asp Tyr Cys Pro Thr Leu Ala Thr Ser Cys Pro Lys Lys Pro Ala Gly
25 30 35

cgt aag aag ttt cgt gag act cgt cac cca att tac aga gga gtt cgt 319
Arg Lys Lys Phe Arg Glu Thr Arg His Pro Ile Tyr Arg Gly Val Arg
40 45 50

caa aga aac tcc ggt aag tgg gtt tct gaa gtg aga gag cca aac aag 367
Gln Arg Asn Ser Gly Lys Trp Val Ser Glu Val Arg Glu Pro Asn Lys
55 60 65

aaa acc agg att tgg ctc ggg act ttc caa acc gct gag atg gca gct 415
Lys Thr Arg Ile Trp Leu Gly Thr Phe Gln Thr Ala Glu Met Ala Ala
70 75 80

cgt gct cac gac gtc gct gca tta gcc ctc cgt ggc cga tca gca tgt 463
Arg Ala His Asp Val Ala Ala Leu Ala Leu Arg Gly Arg Ser Ala Cys
85 90 95 100

ctc aac ttc gct gac tcg gct tgg cgg cta cga atc ccg gag tca aca 511
Leu Asn Phe Ala Asp Ser Ala Trp Arg Leu Arg Ile Pro Glu Ser Thr
105 110 115

tgc gcc aag gat atc caa aaa gcg gct gct gaa gcg gcg ttg gct ttt 559
Cys Ala Lys Asp Ile Gln Lys Ala Ala Ala Glu Ala Ala Leu Ala Phe
120 125 130

caa gat gag acg tgt gat acg acg acc acg aat cat ggc ctg gac atg 607
Gln Asp Glu Thr Cys Asp Thr Thr Thr Thr Asn His Gly Leu Asp Met
135 140 145

gag gag acg atg gtg gaa gct att tat aca ccg gaa cag agc gaa ggt 655
Glu Glu Thr Met Val Glu Ala Ile Tyr Thr Pro Glu Gln Ser Glu Gly
150 155 160

gcg ttt tat atg gat gag gag aca atg ttt ggg atg ccg act ttg ttg 703
Ala Phe Tyr Met Asp Glu Glu Thr Met Phe Gly Met Pro Thr Leu Leu
165 170 175 180

gat aat atg gct gaa ggc atg ctt tta ccg ccg ccg tct gtt caa tgg 751

Asp Asn Met Ala Glu Gly Met Leu Leu Pro Pro Pro Ser Val Gln Trp
185 190 195

aat cat aat tat gac ggc gaa gga gat ggt gac gtg tcg ctt tgg agt 799
Asn His Asn Tyr Asp Gly Glu Gly Asp Gly Asp Val Ser Leu Trp Ser
200 205 210

tac taa tattcgatag tcgtttccat ttttgtacta tagtttgaaa atattctagt 855
Tyr

tccttttttt agaatggttc cttcatttta ttttatttta ttgttgtaga aacgagtgga 915

aaataattca atac 929

<210> 350 <211> 213 <212> PRT <213> Arabidopsis thaliana <400> 350

Met Asn Ser Phe Ser Ala Phe Ser Glu Met Phe Gly Ser Asp Tyr Glu
1 5 10 15

Pro Gln Gly Gly Asp Tyr Cys Pro Thr Leu Ala Thr Ser Cys Pro Lys
20 25 30

Lys Pro Ala Gly Arg Lys Lys Phe Arg Glu Thr Arg His Pro Ile Tyr
35 40 45

Arg Gly Val Arg Gln Arg Asn Ser Gly Lys Trp Val Ser Glu Val Arg
50 55 60

Glu Pro Asn Lys Lys Thr Arg Ile Trp Leu Gly Thr Phe Gln Thr Ala
65 70 75 80

Glu Met Ala Ala Arg Ala His Asp Val Ala Ala Leu Ala Leu Arg Gly
85 90 95

Arg Ser Ala Cys Leu Asn Phe Ala Asp Ser Ala Trp Arg Leu Arg Ile
100 105 110

Pro Glu Ser Thr Cys Ala Lys Asp Ile Gln Lys Ala Ala Ala Glu Ala
115 120 125

Ala Leu Ala Phe Gln Asp Glu Thr Cys Asp Thr Thr Thr Thr Asn His
130 135 140

Gly Leu Asp Met Glu Glu Thr Met Val Glu Ala Ile Tyr Thr Pro Glu
145 150 155 160

Gln Ser Glu Gly Ala Phe Tyr Met Asp Glu Glu Thr Met Phe Gly Met
165 170 175

Pro Thr Leu Leu Asp Asn Met Ala Glu Gly Met Leu Leu Pro Pro Pro
180 185 190

Ser Val Gln Trp Asn His Asn Tyr Asp Gly Glu Gly Asp Gly Asp Val
195 200 205

Ser Leu Trp Ser Tyr
210

<210> 351 <211> 803 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (35)..(658) <223> G41

<400> 351
ctgatcaatg aactcatttt ctgcctttc tgaa atg ttt ggc tcc gat tac gag 55
Met Phe Gly Ser Asp Tyr Glu
1 5

tct ccg gtt tcc tca ggc ggt gat tac agt ccg aag ctt gcc acg agc 103
Ser Pro Val Ser Ser Gly Gly Asp Tyr Ser Pro Lys Leu Ala Thr Ser
10 15 20

tgc ccc aag aaa cca gcg gga agg aag aag ttt cgt gag act cgt cac 151
Cys Pro Lys Lys Pro Ala Gly Arg Lys Lys Phe Arg Glu Thr Arg His
25 30 35

cca att tac aga gga gtt cgt caa aga aac tcc ggt aag tgg gtg tgt 199
Pro Ile Tyr Arg Gly Val Arg Gln Arg Asn Ser Gly Lys Trp Val Cys
40 45 50 55

gag ttg aga gag cca aac aag aaa acg agg att tgg ctc ggg act ttc 247
Glu Leu Arg Glu Pro Asn Lys Lys Thr Arg Ile Trp Leu Gly Thr Phe
60 65 70

caa acc gct gag atg gca gct cgt gct cac gac gtc gcc gcc ata gct 295
Gln Thr Ala Glu Met Ala Ala Arg Ala His Asp Val Ala Ala Ile Ala
75 80 85

ctc cgt ggc aga tct gcc tgt ctc aat ttc gct gac tcg gct tgg cgg 343
Leu Arg Gly Arg Ser Ala Cys Leu Asn Phe Ala Asp Ser Ala Trp Arg
90 95 100

cta cga atc ccg gaa tca acc tgt gcc aag gaa atc caa aag gcg gcg 391
Leu Arg Ile Pro Glu Ser Thr Cys Ala Lys Glu Ile Gln Lys Ala Ala
105 110 115

gct gaa gcc gcg ttg aat ttt caa gat gag atg tgt cat atg acg acg 439
Ala Glu Ala Ala Leu Asn Phe Gln Asp Glu Met Cys His Met Thr Thr
120 125 130 135

gat gct cat ggt ctt gac atg gag gag acc ttg gtg gag gct att tat 487
Asp Ala His Gly Leu Asp Met Glu Glu Thr Leu Val Glu Ala Ile Tyr
140 145 150

acg ccg gaa cag agc caa gat gcg ttt tat atg gat gaa gag gcg atg 535
Thr Pro Glu Gln Ser Gln Asp Ala Phe Tyr Met Asp Glu Glu Ala Met
155 160 165

ttg ggg atg tct agt ttg ttg gat aac atg gcc gaa ggg atg ctt tta 583
Leu Gly Met Ser Ser Leu Leu Asp Asn Met Ala Glu Gly Met Leu Leu
170 175 180

ccg tcg ccg tcg gtt caa tgg aac tat aat ttt gat gtc gag gga gat 631
Pro Ser Pro Ser Val Gln Trp Asn Tyr Asn Phe Asp Val Glu Gly Asp
185 190 195

gat gac gtg tcc tta tgg agc tat taa aattcgattt ttatttccat 678
Asp Asp Val Ser Leu Trp Ser Tyr
200 205

ttttggtatt atagcttttt atacatttga tccttttttа gaatggatct tcttcttttt 738

ttggttgtga gaaacgaatg taaatggtaa aagttgttgt caaatgcaaa tgtttttgag 798

tgcag 803

<210> 352 <211> 207 <212> PRT <213> Arabidopsis thaliana <400> 352

Met Phe Gly Ser Asp Tyr Glu Ser Pro Val Ser Ser Gly Gly Asp Tyr
1 5 10 15

Ser Pro Lys Leu Ala Thr Ser Cys Pro Lys Lys Pro Ala Gly Arg Lys
20 25 30

Lys Phe Arg Glu Thr Arg His Pro Ile Tyr Arg Gly Val Arg Gln Arg
35 40 45

Asn Ser Gly Lys Trp Val Cys Glu Leu Arg Glu Pro Asn Lys Lys Thr
50 55 60

Arg Ile Trp Leu Gly Thr Phe Gln Thr Ala Glu Met Ala Ala Arg Ala
65 70 75 80

His Asp Val Ala Ala Ile Ala Leu Arg Gly Arg Ser Ala Cys Leu Asn
85 90 95

Phe Ala Asp Ser Ala Trp Arg Leu Arg Ile Pro Glu Ser Thr Cys Ala
100 105 110

Lys Glu Ile Gln Lys Ala Ala Ala Glu Ala Ala Leu Asn Phe Gln Asp
115 120 125

Glu Met Cys His Met Thr Thr Asp Ala His Gly Leu Asp Met Glu Glu
130 135 140

Thr Leu Val Glu Ala Ile Tyr Thr Pro Glu Gln Ser Gln Asp Ala Phe
145 150 155 160

Tyr Met Asp Glu Glu Ala Met Leu Gly Met Ser Ser Leu Leu Asp Asn
165 170 175

Met Ala Glu Gly Met Leu Leu Pro Ser Pro Ser Val Gln Trp Asn Tyr
180 185 190

Asn Phe Asp Val Glu Gly Asp Asp Asp Val Ser Leu Trp Ser Tyr
195 200 205

<210> 353 <211> 908 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (119)..(769) <223> G42

<400> 353
cctgaactag aacagaaaga gagagaaact attatttcag caaaccatac caacaaaaaa 60

gacagagatc ttttagttac cttatccagt ttcttgaaac agagtactct tctgatca 118

atg aac tca ttt tct gct ttt tct gaa atg ttt ggc tcc gat tac gag 166
Met Asn Ser Phe Ser Ala Phe Ser Glu Met Phe Gly Ser Asp Tyr Glu
1 5 10 15

tct tcg gtt tcc tca ggc ggt gat tat att ccg acg ctt gcg agc agc 214
Ser Ser Val Ser Ser Gly Gly Asp Tyr Ile Pro Thr Leu Ala Ser Ser
20 25 30

tgc ccc aag aaa ccg gcg ggt cgt aag aag ttt cgt gag act cgt cac 262
Cys Pro Lys Lys Pro Ala Gly Arg Lys Lys Phe Arg Glu Thr Arg His
35 40 45

cca ata tac aga gga gtt cgt cgg aga aac tcc ggt aag tgg gtt tgt 310
Pro Ile Tyr Arg Gly Val Arg Arg Arg Asn Ser Gly Lys Trp Val Cys
50 55 60

gag gtt aga gaa cca aac aag aaa aca agg att tgg ctc gga aca ttt 358
Glu Val Arg Glu Pro Asn Lys Lys Thr Arg Ile Trp Leu Gly Thr Phe
65 70 75 80

caa acc gct gag atg gca gct cga gct cac gac gtt gcc gct tta gcc 406
Gln Thr Ala Glu Met Ala Ala Arg Ala His Asp Val Ala Ala Leu Ala
85 90 95

ctt cgt ggc cga tca gcc tgt ctc aat ttc gct gac tcg gct tgg aga 454

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Leu Arg Gly Arg Ser Ala Cys Leu Asn Phe Ala Asp Ser Ala Trp Arg
            100                 105                 110

ctc cga atc ccg gaa tca act tgc gct aag gac atc caa aag gcg gcg      502
Leu Arg Ile Pro Glu Ser Thr Cys Ala Lys Asp Ile Gln Lys Ala Ala
        115                 120                 125

gct gaa gct gcg ttg gcg ttt cag gat gag atg tgt gat gcg acg acg      550
Ala Glu Ala Ala Leu Ala Phe Gln Asp Glu Met Cys Asp Ala Thr Thr
    130                 135                 140

gat cat ggc ttc gac atg gag gag acg ttg gtg gag gct att tac acg      598
Asp His Gly Phe Asp Met Glu Glu Thr Leu Val Glu Ala Ile Tyr Thr
145                 150                 155                 160

gcg gaa cag agc gaa aat gcg ttt tat atg cac gat gag gcg atg ttt      646
Ala Glu Gln Ser Glu Asn Ala Phe Tyr Met His Asp Glu Ala Met Phe
                165                 170                 175

gag atg ccg agt ttg ttg gct aat atg gca gaa ggg atg ctt ttg ccg      694
Glu Met Pro Ser Leu Leu Ala Asn Met Ala Glu Gly Met Leu Leu Pro
            180                 185                 190

ctt ccg tcc gta cag tgg aat cat aat cat gaa gtc gac ggc gat gat      742
Leu Pro Ser Val Gln Trp Asn His Asn His Glu Val Asp Gly Asp Asp
        195                 200                 205

gac gac gta tcg tta tgg agt tat taa aactcagatt attatttcca            789
Asp Asp Val Ser Leu Trp Ser Tyr
    210                 215

tttttagtac gatacttttt attttattat tatttttaga tccttttttа gaatggaatc    849

tacattatgt ttgtaaaact gagaaacgag tgtaaattaa attgattcag tttcagtat     908


<210>  354 <211>  216 <212>  PRT <213>  Arabidopsis thaliana  <400>  354

Met Asn Ser Phe Ser Ala Phe Ser Glu Met Phe Gly Ser Asp Tyr Glu
1               5                   10                  15

Ser Ser Val Ser Ser Gly Gly Asp Tyr Ile Pro Thr Leu Ala Ser Ser
            20                  25                  30

Cys Pro Lys Lys Pro Ala Gly Arg Lys Lys Phe Arg Glu Thr Arg His
        35                  40                  45

Pro Ile Tyr Arg Gly Val Arg Arg Arg Asn Ser Gly Lys Trp Val Cys
    50                  55                  60

Glu Val Arg Glu Pro Asn Lys Lys Thr Arg Ile Trp Leu Gly Thr Phe
65                  70                  75                  80
```

Gln Thr Ala Glu Met Ala Ala Arg Ala His Asp Val Ala Ala Leu Ala
85 90 95

Leu Arg Gly Arg Ser Ala Cys Leu Asn Phe Ala Asp Ser Ala Trp Arg
100 105 110

Leu Arg Ile Pro Glu Ser Thr Cys Ala Lys Asp Ile Gln Lys Ala Ala
115 120 125

Ala Glu Ala Ala Leu Ala Phe Gln Asp Glu Met Cys Asp Ala Thr Thr
130 135 140

Asp His Gly Phe Asp Met Glu Glu Thr Leu Val Glu Ala Ile Tyr Thr
145 150 155 160

Ala Glu Gln Ser Glu Asn Ala Phe Tyr Met His Asp Glu Ala Met Phe
165 170 175

Glu Met Pro Ser Leu Leu Ala Asn Met Ala Glu Gly Met Leu Leu Pro
180 185 190

Leu Pro Ser Val Gln Trp Asn His Asn His Glu Val Asp Gly Asp Asp
195 200 205

Asp Asp Val Ser Leu Trp Ser Tyr
210 215

<210> 355 <211> 959 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (50)..(733) <223> G152

<400> 355
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Met Gly Arg
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ggg aag att gtg atc cag aag atc gat gat tcc acg agt aga caa gtc 106
Gly Lys Ile Val Ile Gln Lys Ile Asp Asp Ser Thr Ser Arg Gln Val
5 10 15

act ttc tcc aaa aga aga aag ggt ctc atc aag aaa gct aaa gaa ctt 154
Thr Phe Ser Lys Arg Arg Lys Gly Leu Ile Lys Lys Ala Lys Glu Leu
20 25 30 35

gct att ctc tgc gac gcc gag gtc tgt ctc atc att ttc tcc aac act 202
Ala Ile Leu Cys Asp Ala Glu Val Cys Leu Ile Ile Phe Ser Asn Thr
40 45 50

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gac aag ctc tat gac ttt gcc agc tcc agt gtg aaa tct act att gaa      250
Asp Lys Leu Tyr Asp Phe Ala Ser Ser Ser Val Lys Ser Thr Ile Glu
            55                  60                  65

cga ttc aat acg gct aag atg gag gag caa gaa cta atg aac cct gca      298
Arg Phe Asn Thr Ala Lys Met Glu Glu Gln Glu Leu Met Asn Pro Ala
        70                  75                  80

tca gaa gtt aag ttt tgg cag aga gag gct gaa act cta agg caa gaa      346
Ser Glu Val Lys Phe Trp Gln Arg Glu Ala Glu Thr Leu Arg Gln Glu
    85                  90                  95

ttg cac tca ttg caa gaa aat tat cgg caa cta acg gga gtg gaa tta      394
Leu His Ser Leu Gln Glu Asn Tyr Arg Gln Leu Thr Gly Val Glu Leu
100                 105                 110                 115

aat ggt ttg agc gtt aag gag tta caa aac ata gag agt caa ctt gaa      442
Asn Gly Leu Ser Val Lys Glu Leu Gln Asn Ile Glu Ser Gln Leu Glu
                120                 125                 130

atg agt tta cgt gga att cgt atg aaa agg gaa caa att ttg acc aat      490
Met Ser Leu Arg Gly Ile Arg Met Lys Arg Glu Gln Ile Leu Thr Asn
            135                 140                 145

gaa att aaa gag cta acc aga aag agg aat ctt gtt cat cat gaa aac      538
Glu Ile Lys Glu Leu Thr Arg Lys Arg Asn Leu Val His His Glu Asn
        150                 155                 160

ctc gaa ttg tcg aga aaa gta caa agg att cat caa gaa aat gtc gaa      586
Leu Glu Leu Ser Arg Lys Val Gln Arg Ile His Gln Glu Asn Val Glu
    165                 170                 175

cta tac aag aag gct tat gga acg tcg aac aca aat gga ttg gga cat      634
Leu Tyr Lys Lys Ala Tyr Gly Thr Ser Asn Thr Asn Gly Leu Gly His
180                 185                 190                 195

cat gag cta gta gat gca gtt tat gaa tcc cat gca cag gtt agg ctg      682
His Glu Leu Val Asp Ala Val Tyr Glu Ser His Ala Gln Val Arg Leu
                200                 205                 210

cag cta agc cag cct gag cag tcc cat tat aag aca tct tca aac agc      730
Gln Leu Ser Gln Pro Glu Gln Ser His Tyr Lys Thr Ser Ser Asn Ser
            215                 220                 225

taa gatcatataa gagatatata acaaattgtt cgttcttgat tatctcaaaa           783

ccctttcaaa tatatatacg tgcatattat atatgaagac tcgtttgact atgtcaatat    843

atatgttttc atgcaggagt aagtgtgagt gtaatcatgt cggagagcaa accaaaggtt    903

tgatttgtac gatatatact tatatatggt ctcaagtgaa agcaatggaa cagctt        959
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1               5                   10                  15
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Arg Gln Val Thr Phe Ser Lys Arg Arg Lys Gly Leu Ile Lys Lys Ala
20 25 30

Lys Glu Leu Ala Ile Leu Cys Asp Ala Glu Val Cys Leu Ile Ile Phe
35 40 45

Ser Asn Thr Asp Lys Leu Tyr Asp Phe Ala Ser Ser Ser Val Lys Ser
50 55 60

Thr Ile Glu Arg Phe Asn Thr Ala Lys Met Glu Glu Gln Glu Leu Met
65 70 75 80

Asn Pro Ala Ser Glu Val Lys Phe Trp Gln Arg Glu Ala Glu Thr Leu
85 90 95

Arg Gln Glu Leu His Ser Leu Gln Glu Asn Tyr Arg Gln Leu Thr Gly
100 105 110

Val Glu Leu Asn Gly Leu Ser Val Lys Glu Leu Gln Asn Ile Glu Ser
115 120 125

Gln Leu Glu Met Ser Leu Arg Gly Ile Arg Met Lys Arg Glu Gln Ile
130 135 140

Leu Thr Asn Glu Ile Lys Glu Leu Thr Arg Lys Arg Asn Leu Val His
145 150 155 160

His Glu Asn Leu Glu Leu Ser Arg Lys Val Gln Arg Ile His Gln Glu
165 170 175

Asn Val Glu Leu Tyr Lys Lys Ala Tyr Gly Thr Ser Asn Thr Asn Gly
180 185 190

Leu Gly His His Glu Leu Val Asp Ala Val Tyr Glu Ser His Ala Gln
195 200 205

Val Arg Leu Gln Leu Ser Gln Pro Glu Gln Ser His Tyr Lys Thr Ser
210 215 220

Ser Asn Ser
225

<210> 357 <211> 1098 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (97)..(801) <223> G153

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tcaattggtt ttggtgttag tcttttgggg agagag atg ggg aga ggg aag ata 114
Met Gly Arg Gly Lys Ile
1 5

gtt ata cga agg atc gat aac tct aca agt aga caa gtg act ttc tcc 162
Val Ile Arg Arg Ile Asp Asn Ser Thr Ser Arg Gln Val Thr Phe Ser
10 15 20

aag aga agg agt ggt ttg ctt aag aag gct aaa gag tta tcg atc ctt 210
Lys Arg Arg Ser Gly Leu Leu Lys Lys Ala Lys Glu Leu Ser Ile Leu
25 30 35

tgt gat gca gaa gtt ggt gtt atc ata ttc tct agc acc gga aag ctc 258
Cys Asp Ala Glu Val Gly Val Ile Ile Phe Ser Ser Thr Gly Lys Leu
40 45 50

tac gac tac gca agc aat tca agt atg aaa aca atc att gag cgg tac 306
Tyr Asp Tyr Ala Ser Asn Ser Ser Met Lys Thr Ile Ile Glu Arg Tyr
55 60 65 70

aac aga gta aaa gag gag cag cat caa ctt ctg aat cat gcc tca gag 354
Asn Arg Val Lys Glu Glu Gln His Gln Leu Leu Asn His Ala Ser Glu
75 80 85

ata aag ttt tgg caa aga gag gtt gca agt ttg cag cag cag ctc caa 402
Ile Lys Phe Trp Gln Arg Glu Val Ala Ser Leu Gln Gln Gln Leu Gln
90 95 100

cat cta caa gaa tgc cac agg aaa cta gtg gga gag gaa ctt tct gga 450
His Leu Gln Glu Cys His Arg Lys Leu Val Gly Glu Glu Leu Ser Gly
105 110 115

atg aat gct aac gac cta caa aat ctt gaa gac cag cta gta aca agt 498
Met Asn Ala Asn Asp Leu Gln Asn Leu Glu Asp Gln Leu Val Thr Ser
120 125 130

cta aaa ggt gtt cgt ctc aaa aag gat caa ctt atg aca aat gaa atc 546
Leu Lys Gly Val Arg Leu Lys Lys Asp Gln Leu Met Thr Asn Glu Ile
135 140 145 150

aga gaa ctt aat cgt aag gga caa atc atc caa aaa gag aat cac gag 594
Arg Glu Leu Asn Arg Lys Gly Gln Ile Ile Gln Lys Glu Asn His Glu
155 160 165

cta caa aat att gta gat ata atg cgt aag gaa aat att aaa ttg caa 642
Leu Gln Asn Ile Val Asp Ile Met Arg Lys Glu Asn Ile Lys Leu Gln
170 175 180

aag aag gtt cat gga aga aca aat gtg att gaa ggc aat tca agt gta 690
Lys Lys Val His Gly Arg Thr Asn Val Ile Glu Gly Asn Ser Ser Val

```
        185                 190                 195

gat cca ata agc aat gga acc aca aca tat gca cca ccg caa ctt caa      738
Asp Pro Ile Ser Asn Gly Thr Thr Thr Tyr Ala Pro Pro Gln Leu Gln
    200                 205                 210

ctc ata caa cta caa cca gct cct aga gaa aaa tca atc aga cta ggg      786
Leu Ile Gln Leu Gln Pro Ala Pro Arg Glu Lys Ser Ile Arg Leu Gly
215                 220                 225                 230

cta caa ctt tcc tag caaaacatgt gggacatcga acaatatacg aaaagagttt      841
Leu Gln Leu Ser


gtatgtcatc ttcagtaaca accaagctgg atcatttcat tcttggttat gtaattctgt    901

ttactacttt ggagtttaat atgttatatg acaagtttct ctttgtcaag ttacttgtgt    961

atgtacatca taaaataatg atgtgatgtg agtgccgaac atactagaca tcattttacc   1021

gtgtgttttt ttcgggtaca ttaaatgtac aaaatccagt ctaattggca tttttataca   1081

aaaaaaaaaa aaaaaaa                                                  1098


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Met Gly Arg Gly Lys Ile Val Ile Arg Arg Ile Asp Asn Ser Thr Ser
1               5                   10                  15

Arg Gln Val Thr Phe Ser Lys Arg Arg Ser Gly Leu Leu Lys Lys Ala
            20                  25                  30

Lys Glu Leu Ser Ile Leu Cys Asp Ala Glu Val Gly Val Ile Ile Phe
        35                  40                  45

Ser Ser Thr Gly Lys Leu Tyr Asp Tyr Ala Ser Asn Ser Ser Met Lys
    50                  55                  60

Thr Ile Ile Glu Arg Tyr Asn Arg Val Lys Glu Glu Gln His Gln Leu
65                  70                  75                  80

Leu Asn His Ala Ser Glu Ile Lys Phe Trp Gln Arg Glu Val Ala Ser
                85                  90                  95

Leu Gln Gln Gln Leu Gln His Leu Gln Glu Cys His Arg Lys Leu Val
            100                 105                 110

Gly Glu Glu Leu Ser Gly Met Asn Ala Asn Asp Leu Gln Asn Leu Glu
        115                 120                 125
```

Replacement Sheet - 09/25/2014

```
Asp Gln Leu Val Thr Ser Leu Lys Gly Val Arg Leu Lys Lys Asp Gln
    130                 135                 140

Leu Met Thr Asn Glu Ile Arg Glu Leu Asn Arg Lys Gly Gln Ile Ile
145                 150                 155                 160

Gln Lys Glu Asn His Glu Leu Gln Asn Ile Val Asp Ile Met Arg Lys
                165                 170                 175

Glu Asn Ile Lys Leu Gln Lys Lys Val His Gly Arg Thr Asn Val Ile
            180                 185                 190

Glu Gly Asn Ser Ser Val Asp Pro Ile Ser Asn Gly Thr Thr Thr Tyr
        195                 200                 205

Ala Pro Pro Gln Leu Gln Leu Ile Gln Leu Gln Pro Ala Pro Arg Glu
    210                 215                 220

Lys Ser Ile Arg Leu Gly Leu Gln Leu Ser
225                 230
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ctttcaacca aacccctaaa caaaaaaaaa atacattttc tgatctctct aaaaatcttt     60

ctccttcgtt aatctcgtga tctctttctt tttctatat atg gac aga gga tgg       114
                                              Met Asp Arg Gly Trp
                                              1               5

tct ggt ctc act ctt gat tca tct tct ctt gat ctt tta aac cct aat      162
Ser Gly Leu Thr Leu Asp Ser Ser Ser Leu Asp Leu Leu Asn Pro Asn
                10                  15                  20

cgt att tct cat aag aat cac cga cgt ttc tca aat cct ttg gcg atg      210
Arg Ile Ser His Lys Asn His Arg Arg Phe Ser Asn Pro Leu Ala Met
            25                  30                  35

tct aga att gac gaa gaa gat gat cag aag acg aga ata tca acc aac      258
Ser Arg Ile Asp Glu Glu Asp Asp Gln Lys Thr Arg Ile Ser Thr Asn
        40                  45                  50

ggt agt gaa ttt agg ttt ccg gtg agt ctc tca ggt att cgt gat cgt      306
Gly Ser Glu Phe Arg Phe Pro Val Ser Leu Ser Gly Ile Arg Asp Arg
    55                  60                  65

gaa gat gaa gat ttt tca tct ggc gtt gct gga gat aat gac cgt gaa      354
```

```
Glu Asp Glu Asp Phe Ser Ser Gly Val Ala Gly Asp Asn Asp Arg Glu
70                  75                  80                  85

gtt ccc ggc gaa gtg gat ttc ttc tcc gac aag aaa tct agg gtt tgt      402
Val Pro Gly Glu Val Asp Phe Phe Ser Asp Lys Lys Ser Arg Val Cys
                90                  95                  100

cgt gaa gac gac gaa gga ttt cgt gtg aag aag gaa gaa caa gat gat      450
Arg Glu Asp Asp Glu Gly Phe Arg Val Lys Lys Glu Glu Gln Asp Asp
            105                 110                 115

cga acg gac gta aat acc ggt ttg aat ctt cga aca act ggt aat aca      498
Arg Thr Asp Val Asn Thr Gly Leu Asn Leu Arg Thr Thr Gly Asn Thr
        120                 125                 130

aag agt gat gag tca atg atc gat gat gga gaa tct tcc gaa atg gaa      546
Lys Ser Asp Glu Ser Met Ile Asp Asp Gly Glu Ser Ser Glu Met Glu
    135                 140                 145

gat aag cgt gcg aaa aat gag ttg gtg aaa tta caa gat gag ttg aag      594
Asp Lys Arg Ala Lys Asn Glu Leu Val Lys Leu Gln Asp Glu Leu Lys
150                 155                 160                 165

aaa atg aca atg gat aat caa aag ctt aga gaa ttg ctt aca caa gtt      642
Lys Met Thr Met Asp Asn Gln Lys Leu Arg Glu Leu Leu Thr Gln Val
                170                 175                 180

agc aac agt tac act tca ctt cag atg cat ctt gtt tca cta atg cag      690
Ser Asn Ser Tyr Thr Ser Leu Gln Met His Leu Val Ser Leu Met Gln
            185                 190                 195

caa cag caa caa cag aac aat aag gta ata gaa gct gct gag aag cct      738
Gln Gln Gln Gln Gln Asn Asn Lys Val Ile Glu Ala Ala Glu Lys Pro
        200                 205                 210

gag gag acg ata gta cca agg caa ttt att gat tta ggc cct acg aga      786
Glu Glu Thr Ile Val Pro Arg Gln Phe Ile Asp Leu Gly Pro Thr Arg
    215                 220                 225

gca gta ggt gag gcc gag gat gtg tca aat tct tca tcc gaa gat aga      834
Ala Val Gly Glu Ala Glu Asp Val Ser Asn Ser Ser Ser Glu Asp Arg
230                 235                 240                 245

act cgt tcg ggg ggt tct tct gca gcc gag agg cgt agt aac ggg aag      882
Thr Arg Ser Gly Gly Ser Ser Ala Ala Glu Arg Arg Ser Asn Gly Lys
                250                 255                 260

aga ctt ggg cgt gaa gaa agc ccc gaa act gag tcc aac aaa att cag      930
Arg Leu Gly Arg Glu Glu Ser Pro Glu Thr Glu Ser Asn Lys Ile Gln
            265                 270                 275

aag gtg aat tct act acc ccg acg aca ttt gat caa acc gct gaa gct      978
Lys Val Asn Ser Thr Thr Pro Thr Thr Phe Asp Gln Thr Ala Glu Ala
        280                 285                 290

acg atg agg aaa gcc cgt gtc tcc gtt cgt gcc cga tcg gaa gct ccg     1026
Thr Met Arg Lys Ala Arg Val Ser Val Arg Ala Arg Ser Glu Ala Pro
```

```
    295                 300                 305

atg ata agc gat gga tgt caa tgg aga aaa tat ggc cag aag atg gcc     1074
Met Ile Ser Asp Gly Cys Gln Trp Arg Lys Tyr Gly Gln Lys Met Ala
310                 315                 320                 325

aaa ggg aat cct tgt ccg cgg gca tat tac cgc tgc acg atg gcc acg     1122
Lys Gly Asn Pro Cys Pro Arg Ala Tyr Tyr Arg Cys Thr Met Ala Thr
                330                 335                 340

ggc tgt ccc gtt cgc aaa caa gtt caa cgt tgc gcg gaa gac aga tca     1170
Gly Cys Pro Val Arg Lys Gln Val Gln Arg Cys Ala Glu Asp Arg Ser
            345                 350                 355

att ctg att aca acc tac gag gga aac cat aac cat ccg ttg ccg cca     1218
Ile Leu Ile Thr Thr Tyr Glu Gly Asn His Asn His Pro Leu Pro Pro
        360                 365                 370

gcc gcg gta gcc atg gct tct acc acc acg gcg gcg gct aac atg ttg     1266
Ala Ala Val Ala Met Ala Ser Thr Thr Thr Ala Ala Ala Asn Met Leu
    375                 380                 385

cta tcc ggg tca atg tct agt cac gac ggg atg atg aac cct aca aat     1314
Leu Ser Gly Ser Met Ser Ser His Asp Gly Met Met Asn Pro Thr Asn
390                 395                 400                 405

tta cta gct agg gct gtt ctt cct tgc tcc aca agc atg gca aca atc     1362
Leu Leu Ala Arg Ala Val Leu Pro Cys Ser Thr Ser Met Ala Thr Ile
                410                 415                 420

tca gcc tcc gcg ccg ttt cca acc gtc aca tta gac ctc acc cac tca     1410
Ser Ala Ser Ala Pro Phe Pro Thr Val Thr Leu Asp Leu Thr His Ser
            425                 430                 435

cct ccg cct cct aat ggt tcc aat cct tcc tct tcc gcg gct acc aac     1458
Pro Pro Pro Pro Asn Gly Ser Asn Pro Ser Ser Ser Ala Ala Thr Asn
        440                 445                 450

aac aac cac aac tca ctg atg cag cgg ccg caa caa caa caa cag caa     1506
Asn Asn His Asn Ser Leu Met Gln Arg Pro Gln Gln Gln Gln Gln Gln
    455                 460                 465

atg acg aac tta cct ccg gga atg cta cct cat gta ata ggc cag gca     1554
Met Thr Asn Leu Pro Pro Gly Met Leu Pro His Val Ile Gly Gln Ala
470                 475                 480                 485

ttg tat aac caa tcc aag ttc tcg ggg ctg cag ttc tct ggt ggc tct     1602
Leu Tyr Asn Gln Ser Lys Phe Ser Gly Leu Gln Phe Ser Gly Gly Ser
                490                 495                 500

ccc tcg acg gca gcg ttt tct cag tca cac gcg gtg gct gat aca ata     1650
Pro Ser Thr Ala Ala Phe Ser Gln Ser His Ala Val Ala Asp Thr Ile
            505                 510                 515

acg gca ctc aca gct gac ccg aat ttc acg gcg gct ctt gca gcc gtt     1698
Thr Ala Leu Thr Ala Asp Pro Asn Phe Thr Ala Ala Leu Ala Ala Val
        520                 525                 530
```

att tct tct atg atc aat ggt acg aac cac cac gac ggc gaa gga aac 1746
Ile Ser Ser Met Ile Asn Gly Thr Asn His His Asp Gly Glu Gly Asn
535 540 545

aac aaa aat caa tag aaaaatatta catttttttt ttgggtatct acatttttt 1801
Asn Lys Asn Gln
550

tccaactggg ttataggaaa cagagagttt atttcattga ttcacatttg ttctgtttcg 1861

taccaaaatc ccagtaaata tacaaaagca aactatactc aagttcatat tcgtaaacac 1921

tataaatagt acgttactta ataaaaaaaa a 1952

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Met Asp Arg Gly Trp Ser Gly Leu Thr Leu Asp Ser Ser Ser Leu Asp
1 5 10 15

Leu Leu Asn Pro Asn Arg Ile Ser His Lys Asn His Arg Arg Phe Ser
20 25 30

Asn Pro Leu Ala Met Ser Arg Ile Asp Glu Glu Asp Asp Gln Lys Thr
35 40 45

Arg Ile Ser Thr Asn Gly Ser Glu Phe Arg Phe Pro Val Ser Leu Ser
50 55 60

Gly Ile Arg Asp Arg Glu Asp Glu Asp Phe Ser Ser Gly Val Ala Gly
65 70 75 80

Asp Asn Asp Arg Glu Val Pro Gly Glu Val Asp Phe Phe Ser Asp Lys
85 90 95

Lys Ser Arg Val Cys Arg Glu Asp Asp Glu Gly Phe Arg Val Lys Lys
100 105 110

Glu Glu Gln Asp Asp Arg Thr Asp Val Asn Thr Gly Leu Asn Leu Arg
115 120 125

Thr Thr Gly Asn Thr Lys Ser Asp Glu Ser Met Ile Asp Asp Gly Glu
130 135 140

Ser Ser Glu Met Glu Asp Lys Arg Ala Lys Asn Glu Leu Val Lys Leu
145 150 155 160

Gln Asp Glu Leu Lys Lys Met Thr Met Asp Asn Gln Lys Leu Arg Glu
165 170 175

Leu Leu Thr Gln Val Ser Asn Ser Tyr Thr Ser Leu Gln Met His Leu
180 185 190

Val Ser Leu Met Gln Gln Gln Gln Gln Gln Asn Asn Lys Val Ile Glu
195 200 205

Ala Ala Glu Lys Pro Glu Glu Thr Ile Val Pro Arg Gln Phe Ile Asp
210 215 220

Leu Gly Pro Thr Arg Ala Val Gly Glu Ala Glu Asp Val Ser Asn Ser
225 230 235 240

Ser Ser Glu Asp Arg Thr Arg Ser Gly Gly Ser Ser Ala Ala Glu Arg
245 250 255

Arg Ser Asn Gly Lys Arg Leu Gly Arg Glu Glu Ser Pro Glu Thr Glu
260 265 270

Ser Asn Lys Ile Gln Lys Val Asn Ser Thr Thr Pro Thr Thr Phe Asp
275 280 285

Gln Thr Ala Glu Ala Thr Met Arg Lys Ala Arg Val Ser Val Arg Ala
290 295 300

Arg Ser Glu Ala Pro Met Ile Ser Asp Gly Cys Gln Trp Arg Lys Tyr
305 310 315 320

Gly Gln Lys Met Ala Lys Gly Asn Pro Cys Pro Arg Ala Tyr Tyr Arg
325 330 335

Cys Thr Met Ala Thr Gly Cys Pro Val Arg Lys Gln Val Gln Arg Cys
340 345 350

Ala Glu Asp Arg Ser Ile Leu Ile Thr Thr Tyr Glu Gly Asn His Asn
355 360 365

His Pro Leu Pro Pro Ala Ala Val Ala Met Ala Ser Thr Thr Thr Ala
370 375 380

Ala Ala Asn Met Leu Leu Ser Gly Ser Met Ser Ser His Asp Gly Met
385 390 395 400

Met Asn Pro Thr Asn Leu Leu Ala Arg Ala Val Leu Pro Cys Ser Thr
405 410 415

Ser Met Ala Thr Ile Ser Ala Ser Ala Pro Phe Pro Thr Val Thr Leu
420 425 430

Asp Leu Thr His Ser Pro Pro Pro Pro Asn Gly Ser Asn Pro Ser Ser
435 440 445

Ser Ala Ala Thr Asn Asn Asn His Asn Ser Leu Met Gln Arg Pro Gln
450 455 460

Gln Gln Gln Gln Gln Met Thr Asn Leu Pro Pro Gly Met Leu Pro His
465 470 475 480

Val Ile Gly Gln Ala Leu Tyr Asn Gln Ser Lys Phe Ser Gly Leu Gln
485 490 495

Phe Ser Gly Gly Ser Pro Ser Thr Ala Ala Phe Ser Gln Ser His Ala
500 505 510

Val Ala Asp Thr Ile Thr Ala Leu Thr Ala Asp Pro Asn Phe Thr Ala
515 520 525

Ala Leu Ala Ala Val Ile Ser Ser Met Ile Asn Gly Thr Asn His His
530 535 540

Asp Gly Glu Gly Asn Asn Lys Asn Gln
545 550

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<222> (118)..(1074) <223> G187

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ctcttcttct ttgtcttctt tactcttttt ttacctctct cttcattgtt cttcacc 117

atg tct aat gaa acc aga gat ctc tac aac tac caa tac cct tca tcg 165
Met Ser Asn Glu Thr Arg Asp Leu Tyr Asn Tyr Gln Tyr Pro Ser Ser
1 5 10 15

ttt tcg ttg cac gaa atg atg aat ctg cct act tca aat cca tct tct 213

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Phe Ser Leu His Glu Met Met Asn Leu Pro Thr Ser Asn Pro Ser Ser
            20                  25                  30

tat gga aac ctc cca tca caa aac ggt ttt aat cca tct act tat tcc      261
Tyr Gly Asn Leu Pro Ser Gln Asn Gly Phe Asn Pro Ser Thr Tyr Ser
        35                  40                  45

ttc acc gat tgt ctc caa agt tct cca gca gcg tat gaa tct cta ctt      309
Phe Thr Asp Cys Leu Gln Ser Ser Pro Ala Ala Tyr Glu Ser Leu Leu
    50                  55                  60

cag aaa act ttt ggt ctt tct ccc tct tcc tca gag gtt ttc aat tct      357
Gln Lys Thr Phe Gly Leu Ser Pro Ser Ser Ser Glu Val Phe Asn Ser
65                  70                  75                  80

tcg atc gat caa gaa ccg aac cgt gat gtt act aat gac gta atc aat      405
Ser Ile Asp Gln Glu Pro Asn Arg Asp Val Thr Asn Asp Val Ile Asn
                85                  90                  95

ggt ggt gca tgc aac gag act gaa act agg gtt tct cct tct aat tct      453
Gly Gly Ala Cys Asn Glu Thr Glu Thr Arg Val Ser Pro Ser Asn Ser
            100                 105                 110

tcc tct agt gag gct gat cac ccc ggt gaa gat tcc ggt aag agc cgg      501
Ser Ser Ser Glu Ala Asp His Pro Gly Glu Asp Ser Gly Lys Ser Arg
        115                 120                 125

agg aaa cga gag tta gtc ggt gaa gaa gat caa att tcc aaa aaa gtt      549
Arg Lys Arg Glu Leu Val Gly Glu Glu Asp Gln Ile Ser Lys Lys Val
    130                 135                 140

ggg aaa acg aaa aag act gag gtg aag aaa caa aga gag cca cga gtc      597
Gly Lys Thr Lys Lys Thr Glu Val Lys Lys Gln Arg Glu Pro Arg Val
145                 150                 155                 160

tcg ttt atg act aaa agt gaa gtt gat cat ctt gaa gat ggt tat aga      645
Ser Phe Met Thr Lys Ser Glu Val Asp His Leu Glu Asp Gly Tyr Arg
                165                 170                 175

tgg aga aaa tac ggc caa aag gct gta aaa aat agc cct tat cca agg      693
Trp Arg Lys Tyr Gly Gln Lys Ala Val Lys Asn Ser Pro Tyr Pro Arg
            180                 185                 190

agt tac tat aga tgt aca aca caa aag tgc aac gtg aag aaa cga gtg      741
Ser Tyr Tyr Arg Cys Thr Thr Gln Lys Cys Asn Val Lys Lys Arg Val
        195                 200                 205

gag aga tcg ttc caa gat cca acg gtt gtg att aca act tac gag ggt      789
Glu Arg Ser Phe Gln Asp Pro Thr Val Val Ile Thr Thr Tyr Glu Gly
    210                 215                 220

caa cac aac cac ccg att ccg act aat ctt cga gga agt tct gcc gcg      837
Gln His Asn His Pro Ile Pro Thr Asn Leu Arg Gly Ser Ser Ala Ala
225                 230                 235                 240

gct gct atg ttc tcc gca gac ctc atg act cca aga agc ttt gca cat      885
Ala Ala Met Phe Ser Ala Asp Leu Met Thr Pro Arg Ser Phe Ala His
```

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                245                 250                 255

gat atg ttt agg acg gca gct tat act aac ggc ggt tct gtg gcg gcg      933
Asp Met Phe Arg Thr Ala Ala Tyr Thr Asn Gly Gly Ser Val Ala Ala
            260                 265                 270

gct ttg gat tat gga tat gga caa agt ggt tat ggt agt gtg aat tca      981
Ala Leu Asp Tyr Gly Tyr Gly Gln Ser Gly Tyr Gly Ser Val Asn Ser
        275                 280                 285

aac cct agt tct cac caa gtg tat cat caa ggg ggt gag tat gag ctc     1029
Asn Pro Ser Ser His Gln Val Tyr His Gln Gly Gly Glu Tyr Glu Leu
    290                 295                 300

ttg agg gag att ttt cct tca att ttc ttt aag caa gag cct tga         1074
Leu Arg Glu Ile Phe Pro Ser Ile Phe Phe Lys Gln Glu Pro
305                 310                 315

tcgatcattg ttataactac atatattata tatattgaga gagagaggta gagaaaaaaa   1134

aa                                                                  1136


<210>  362 <211>  318 <212>  PRT <213>  Arabidopsis thaliana  <400>  362

Met Ser Asn Glu Thr Arg Asp Leu Tyr Asn Tyr Gln Tyr Pro Ser Ser
1               5                   10                  15

Phe Ser Leu His Glu Met Met Asn Leu Pro Thr Ser Asn Pro Ser Ser
            20                  25                  30

Tyr Gly Asn Leu Pro Ser Gln Asn Gly Phe Asn Pro Ser Thr Tyr Ser
        35                  40                  45

Phe Thr Asp Cys Leu Gln Ser Ser Pro Ala Ala Tyr Glu Ser Leu Leu
    50                  55                  60

Gln Lys Thr Phe Gly Leu Ser Pro Ser Ser Ser Glu Val Phe Asn Ser
65                  70                  75                  80

Ser Ile Asp Gln Glu Pro Asn Arg Asp Val Thr Asn Asp Val Ile Asn
                85                  90                  95

Gly Gly Ala Cys Asn Glu Thr Glu Thr Arg Val Ser Pro Ser Asn Ser
            100                 105                 110

Ser Ser Ser Glu Ala Asp His Pro Gly Glu Asp Ser Gly Lys Ser Arg
        115                 120                 125
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Arg Lys Arg Glu Leu Val Gly Glu Glu Asp Gln Ile Ser Lys Lys Val
130 135 140

Gly Lys Thr Lys Lys Thr Glu Val Lys Lys Gln Arg Glu Pro Arg Val
145 150 155 160

Ser Phe Met Thr Lys Ser Glu Val Asp His Leu Glu Asp Gly Tyr Arg
165 170 175

Trp Arg Lys Tyr Gly Gln Lys Ala Val Lys Asn Ser Pro Tyr Pro Arg
180 185 190

Ser Tyr Tyr Arg Cys Thr Thr Gln Lys Cys Asn Val Lys Lys Arg Val
195 200 205

Glu Arg Ser Phe Gln Asp Pro Thr Val Val Ile Thr Thr Tyr Glu Gly
210 215 220

Gln His Asn His Pro Ile Pro Thr Asn Leu Arg Gly Ser Ser Ala Ala
225 230 235 240

Ala Ala Met Phe Ser Ala Asp Leu Met Thr Pro Arg Ser Phe Ala His
245 250 255

Asp Met Phe Arg Thr Ala Ala Tyr Thr Asn Gly Gly Ser Val Ala Ala
260 265 270

Ala Leu Asp Tyr Gly Tyr Gly Gln Ser Gly Tyr Gly Ser Val Asn Ser
275 280 285

Asn Pro Ser Ser His Gln Val Tyr His Gln Gly Gly Glu Tyr Glu Leu
290 295 300

Leu Arg Glu Ile Phe Pro Ser Ile Phe Phe Lys Gln Glu Pro
305 310 315

<210> 363 <211> 1252 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (145)..(1125) <223> G210

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gaataagtag aagatatctc ttaccttctc cttcttctaa taagatcaga gttttggttc 120

ttatttcttt gacctctcaa aaca atg ggt aga tca ccg tgt tgt gac aaa 171

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                                Met Gly Arg Ser Pro Cys Cys Asp Lys
                                1               5

ttg ggt ttg aag aaa gga cct tgg aca cca gag gag gat cag aaa ctt      219
Leu Gly Leu Lys Lys Gly Pro Trp Thr Pro Glu Glu Asp Gln Lys Leu
10                  15                  20                  25

tta gct tat att gaa gaa cat ggt cat gga agt tgg cgt tca ttg cct      267
Leu Ala Tyr Ile Glu Glu His Gly His Gly Ser Trp Arg Ser Leu Pro
                30                  35                  40

gag aaa gct ggt ctc cat cga tgc gga aag agt tgt aga cta aga tgg      315
Glu Lys Ala Gly Leu His Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp
            45                  50                  55

act aac tac cta aga cct gac atc aaa aga ggc aaa ttc aac tta caa      363
Thr Asn Tyr Leu Arg Pro Asp Ile Lys Arg Gly Lys Phe Asn Leu Gln
        60                  65                  70

gaa gaa caa acc att atc caa ctc cat gct ctg tta gga aac aga tgg      411
Glu Glu Gln Thr Ile Ile Gln Leu His Ala Leu Leu Gly Asn Arg Trp
    75                  80                  85

tca gcg att gct act cat ttg cca aag aga aca gac aac gag atc aag      459
Ser Ala Ile Ala Thr His Leu Pro Lys Arg Thr Asp Asn Glu Ile Lys
90                  95                  100                 105

aac tat tgg aac act cat ttg aag aaa cgg tta gtg aaa atg ggg att      507
Asn Tyr Trp Asn Thr His Leu Lys Lys Arg Leu Val Lys Met Gly Ile
                110                 115                 120

gat cca gtg act cat aaa ccc aaa aac gag act cct tta tct tct ctt      555
Asp Pro Val Thr His Lys Pro Lys Asn Glu Thr Pro Leu Ser Ser Leu
            125                 130                 135

ggt cta tcc aag aac gca gct ata ctt agc cac act gct caa tgg gaa      603
Gly Leu Ser Lys Asn Ala Ala Ile Leu Ser His Thr Ala Gln Trp Glu
        140                 145                 150

agt gca agg ctt gaa gct gaa gca aga cta gct aga gaa tca aag ctt      651
Ser Ala Arg Leu Glu Ala Glu Ala Arg Leu Ala Arg Glu Ser Lys Leu
    155                 160                 165

ctt cat tta caa cat tac caa acc aaa aca tca tct caa cct cat cat      699
Leu His Leu Gln His Tyr Gln Thr Lys Thr Ser Ser Gln Pro His His
170                 175                 180                 185

cat cat gga ttc act cac aag tca ttg tta cct aat tgg aca aca aaa      747
His His Gly Phe Thr His Lys Ser Leu Leu Pro Asn Trp Thr Thr Lys
                190                 195                 200

cca cac gaa gat caa caa cag ctt gaa tct ccg aca tct aca gtg tca      795
Pro His Glu Asp Gln Gln Gln Leu Glu Ser Pro Thr Ser Thr Val Ser
            205                 210                 215

ttc tct gag atg aag gaa tca atc ccg gcg aag ata gag ttt gtc gga      843
Phe Ser Glu Met Lys Glu Ser Ile Pro Ala Lys Ile Glu Phe Val Gly
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        220                 225                 230

tca tca act ggt gtg act ctg atg aaa gaa cct gaa cac gat tgg atc      891
Ser Ser Thr Gly Val Thr Leu Met Lys Glu Pro Glu His Asp Trp Ile
    235                 240                 245

aat tca acg atg cac gag ttt gaa act acg cag atg gga gaa gga atc      939
Asn Ser Thr Met His Glu Phe Glu Thr Thr Gln Met Gly Glu Gly Ile
250                 255                 260                 265

gaa gaa ggg ttc acg ggt ctc ttg ctc ggt ggt gat tca atc gac cgg      987
Glu Glu Gly Phe Thr Gly Leu Leu Leu Gly Gly Asp Ser Ile Asp Arg
                270                 275                 280

agt ttt tcc ggc gat aaa aac gag acg gcc ggc gag agt agt ggt ggt     1035
Ser Phe Ser Gly Asp Lys Asn Glu Thr Ala Gly Glu Ser Ser Gly Gly
            285                 290                 295

gac tgc aac tac tat gag gac aac aag aac tac ttg gac agc att ttc     1083
Asp Cys Asn Tyr Tyr Glu Asp Asn Lys Asn Tyr Leu Asp Ser Ile Phe
        300                 305                 310

aac ttt gta gat cct tca ccg tcg gat tca ccg atg ttc tga             1125
Asn Phe Val Asp Pro Ser Pro Ser Asp Ser Pro Met Phe
    315                 320                 325

atctaagggt tgatatttgt tgggaatgtt tttgattctt tttttagttt ctagtttttg   1185

tgcttaaact ctgattagac aatttttaaa ctaatccaat ttttgcgcta aaaaaaaaaa   1245

aaaaaaa                                                            1252


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Met Gly Arg Ser Pro Cys Cys Asp Lys Leu Gly Leu Lys Lys Gly Pro
1               5                   10                  15

Trp Thr Pro Glu Glu Asp Gln Lys Leu Leu Ala Tyr Ile Glu Glu His
            20                  25                  30

Gly His Gly Ser Trp Arg Ser Leu Pro Glu Lys Ala Gly Leu His Arg
        35                  40                  45

Cys Gly Lys Ser Cys Arg Leu Arg Trp Thr Asn Tyr Leu Arg Pro Asp
    50                  55                  60

Ile Lys Arg Gly Lys Phe Asn Leu Gln Glu Glu Gln Thr Ile Ile Gln
65                  70                  75                  80

Leu His Ala Leu Leu Gly Asn Arg Trp Ser Ala Ile Ala Thr His Leu
                85                  90                  95
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Pro Lys Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp Asn Thr His Leu
100 105 110

Lys Lys Arg Leu Val Lys Met Gly Ile Asp Pro Val Thr His Lys Pro
115 120 125

Lys Asn Glu Thr Pro Leu Ser Ser Leu Gly Leu Ser Lys Asn Ala Ala
130 135 140

Ile Leu Ser His Thr Ala Gln Trp Glu Ser Ala Arg Leu Glu Ala Glu
145 150 155 160

Ala Arg Leu Ala Arg Glu Ser Lys Leu Leu His Leu Gln His Tyr Gln
165 170 175

Thr Lys Thr Ser Ser Gln Pro His His His His Gly Phe Thr His Lys
180 185 190

Ser Leu Leu Pro Asn Trp Thr Thr Lys Pro His Glu Asp Gln Gln Gln
195 200 205

Leu Glu Ser Pro Thr Ser Thr Val Ser Phe Ser Glu Met Lys Glu Ser
210 215 220

Ile Pro Ala Lys Ile Glu Phe Val Gly Ser Ser Thr Gly Val Thr Leu
225 230 235 240

Met Lys Glu Pro Glu His Asp Trp Ile Asn Ser Thr Met His Glu Phe
245 250 255

Glu Thr Thr Gln Met Gly Glu Gly Ile Glu Glu Gly Phe Thr Gly Leu
260 265 270

Leu Leu Gly Gly Asp Ser Ile Asp Arg Ser Phe Ser Gly Asp Lys Asn
275 280 285

Glu Thr Ala Gly Glu Ser Ser Gly Gly Asp Cys Asn Tyr Tyr Glu Asp
290 295 300

Asn Lys Asn Tyr Leu Asp Ser Ile Phe Asn Phe Val Asp Pro Ser Pro
305 310 315 320

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Ser Asp Ser Pro Met Phe
                325


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<222>  (21)..(983) <223>  G227

 <400>  365
gtaccgtcga cgatccggcg atg tca aac ccg acc cgt aag aat atg gag agg      53
                       Met Ser Asn Pro Thr Arg Lys Asn Met Glu Arg
                       1               5                   10

att aaa ggt cca tgg agt cca gaa gaa gat gat ctg ttg cag agg ctt      101
Ile Lys Gly Pro Trp Ser Pro Glu Glu Asp Asp Leu Leu Gln Arg Leu
            15                  20                  25

gtt cag aaa cat ggt ccg agg aac tgg tct ttg att agc aaa tca atc      149
Val Gln Lys His Gly Pro Arg Asn Trp Ser Leu Ile Ser Lys Ser Ile
        30                  35                  40

cct gga cgt tcc ggc aaa tct tgt cgt ctc cgg tgg tgt aac cag cta      197
Pro Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp Cys Asn Gln Leu
    45                  50                  55

tct ccg gag gta gag cac cgt gct ttt tcg cag gaa gaa gac gag acg      245
Ser Pro Glu Val Glu His Arg Ala Phe Ser Gln Glu Glu Asp Glu Thr
60                  65                  70                  75

att att cga gct cac gct cgg ttt ggt aac aag tgg gct acg atc tct      293
Ile Ile Arg Ala His Ala Arg Phe Gly Asn Lys Trp Ala Thr Ile Ser
                80                  85                  90

cgt ctt ctc aat gga cga acc gat aac gct atc aag aat cat tgg aac      341
Arg Leu Leu Asn Gly Arg Thr Asp Asn Ala Ile Lys Asn His Trp Asn
            95                  100                 105

tcg acg ctg aag cga aaa tgc agc gtc gaa ggg caa agt tgt gat ttt      389
Ser Thr Leu Lys Arg Lys Cys Ser Val Glu Gly Gln Ser Cys Asp Phe
        110                 115                 120

ggt ggt aat gga ggg tat gat ggt aat tta gga gaa gag caa ccg ttg      437
Gly Gly Asn Gly Gly Tyr Asp Gly Asn Leu Gly Glu Glu Gln Pro Leu
    125                 130                 135

aaa cgt acg gcg agt ggt ggt ggt ggt gtc tcg act ggc ttg tat atg      485
Lys Arg Thr Ala Ser Gly Gly Gly Gly Val Ser Thr Gly Leu Tyr Met
140                 145                 150                 155

agt ccc gga agt cca tcg gga tct gac gtc agc gag caa tct agt ggt      533
Ser Pro Gly Ser Pro Ser Gly Ser Asp Val Ser Glu Gln Ser Ser Gly
                160                 165                 170

ggt gca cac gtg ttt aaa cca acg gtt aga tct gag gtt aca gcg tca      581
Gly Ala His Val Phe Lys Pro Thr Val Arg Ser Glu Val Thr Ala Ser
            175                 180                 185
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tcg tct ggt gaa gat cct cca act tat ctt agt ttg tct ctt cct tgg      629
Ser Ser Gly Glu Asp Pro Pro Thr Tyr Leu Ser Leu Ser Leu Pro Trp
        190                 195                 200

act gac gag acg gtt cga gtc aac gag ccg gtt caa ctt aac cag aat      677
Thr Asp Glu Thr Val Arg Val Asn Glu Pro Val Gln Leu Asn Gln Asn
    205                 210                 215

acg gtt atg gac ggt ggt tat acg gcg gag ctg ttt ccg gtt aga aag      725
Thr Val Met Asp Gly Gly Tyr Thr Ala Glu Leu Phe Pro Val Arg Lys
220                 225                 230                 235

gaa gag caa gtg gaa gta gaa gaa gaa gaa gcg aag ggg ata tct ggt      773
Glu Glu Gln Val Glu Val Glu Glu Glu Glu Ala Lys Gly Ile Ser Gly
                240                 245                 250

gga ttc ggt ggt gag ttc atg acg gtg gtt cag gag atg ata agg acg      821
Gly Phe Gly Gly Glu Phe Met Thr Val Val Gln Glu Met Ile Arg Thr
            255                 260                 265

gag gtg agg agt tac atg gcg gat tta cag cga gga aac gtc ggt ggt      869
Glu Val Arg Ser Tyr Met Ala Asp Leu Gln Arg Gly Asn Val Gly Gly
        270                 275                 280

agt agt tct ggc ggc gga ggt ggc ggt tcg tgt atg cca caa agt gta      917
Ser Ser Ser Gly Gly Gly Gly Gly Gly Ser Cys Met Pro Gln Ser Val
    285                 290                 295

aac agc cgt cgt gtt ggg ttt aga gag ttt ata gtg aac caa atc gga      965
Asn Ser Arg Arg Val Gly Phe Arg Glu Phe Ile Val Asn Gln Ile Gly
300                 305                 310                 315

att ggg aag atg gag tag gcggcc                                     989
Ile Gly Lys Met Glu
                320
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<210> 366 <211> 320 <212> PRT <213> Arabidopsis thaliana <400> 366

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Met Ser Asn Pro Thr Arg Lys Asn Met Glu Arg Ile Lys Gly Pro Trp
1               5                   10                  15

Ser Pro Glu Glu Asp Asp Leu Leu Gln Arg Leu Val Gln Lys His Gly
            20                  25                  30

Pro Arg Asn Trp Ser Leu Ile Ser Lys Ser Ile Pro Gly Arg Ser Gly
        35                  40                  45

Lys Ser Cys Arg Leu Arg Trp Cys Asn Gln Leu Ser Pro Glu Val Glu
    50                  55                  60

His Arg Ala Phe Ser Gln Glu Glu Asp Glu Thr Ile Ile Arg Ala His
65                  70                  75                  80
```

Ala Arg Phe Gly Asn Lys Trp Ala Thr Ile Ser Arg Leu Leu Asn Gly
85 90 95

Arg Thr Asp Asn Ala Ile Lys Asn His Trp Asn Ser Thr Leu Lys Arg
100 105 110

Lys Cys Ser Val Glu Gly Gln Ser Cys Asp Phe Gly Gly Asn Gly Gly
115 120 125

Tyr Asp Gly Asn Leu Gly Glu Glu Gln Pro Leu Lys Arg Thr Ala Ser
130 135 140

Gly Gly Gly Gly Val Ser Thr Gly Leu Tyr Met Ser Pro Gly Ser Pro
145 150 155 160

Ser Gly Ser Asp Val Ser Glu Gln Ser Ser Gly Gly Ala His Val Phe
165 170 175

Lys Pro Thr Val Arg Ser Glu Val Thr Ala Ser Ser Ser Gly Glu Asp
180 185 190

Pro Pro Thr Tyr Leu Ser Leu Ser Leu Pro Trp Thr Asp Glu Thr Val
195 200 205

Arg Val Asn Glu Pro Val Gln Leu Asn Gln Asn Thr Val Met Asp Gly
210 215 220

Gly Tyr Thr Ala Glu Leu Phe Pro Val Arg Lys Glu Glu Gln Val Glu
225 230 235 240

Val Glu Glu Glu Glu Ala Lys Gly Ile Ser Gly Gly Phe Gly Gly Glu
245 250 255

Phe Met Thr Val Val Gln Glu Met Ile Arg Thr Glu Val Arg Ser Tyr
260 265 270

Met Ala Asp Leu Gln Arg Gly Asn Val Gly Gly Ser Ser Ser Gly Gly
275 280 285

Gly Gly Gly Gly Ser Cys Met Pro Gln Ser Val Asn Ser Arg Arg Val
290 295 300

Gly Phe Arg Glu Phe Ile Val Asn Gln Ile Gly Ile Gly Lys Met Glu
305 310 315 320

<210> 367 <211> 920 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(852) <223> G237

<400> 367

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atg gcg aag acg aaa tat gga gag aga cat agg aaa ggg tta tgg tca      48
Met Ala Lys Thr Lys Tyr Gly Glu Arg His Arg Lys Gly Leu Trp Ser
1               5                   10                  15

cct gaa gaa gac gag aag cta agg agc ttc atc ctc tct tat ggc cat      96
Pro Glu Glu Asp Glu Lys Leu Arg Ser Phe Ile Leu Ser Tyr Gly His
            20                  25                  30

tct tgc tgg acc act gtt ccc atc aaa gct ggg tta caa agg aat ggg     144
Ser Cys Trp Thr Thr Val Pro Ile Lys Ala Gly Leu Gln Arg Asn Gly
        35                  40                  45

aag agc tgc aga tta aga tgg att aat tac cta aga cca ggg tta aag     192
Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Pro Gly Leu Lys
    50                  55                  60

agg gat atg att agt gca gaa gaa gaa gag act atc ttg acg ttt cat     240
Arg Asp Met Ile Ser Ala Glu Glu Glu Glu Thr Ile Leu Thr Phe His
65                  70                  75                  80

tct ccc ttg ggt aac aag tgg tcg caa ata gct aaa ttc tta ccg gga     288
Ser Pro Leu Gly Asn Lys Trp Ser Gln Ile Ala Lys Phe Leu Pro Gly
                85                  90                  95

aga aca gac aat gag ata aag aac tat tgg cac tct cat ttg aaa aag     336
Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp His Ser His Leu Lys Lys
            100                 105                 110

aaa tgg ctc aag tct cag agc tta caa gat gca aaa tct att tcc cct     384
Lys Trp Leu Lys Ser Gln Ser Leu Gln Asp Ala Lys Ser Ile Ser Pro
        115                 120                 125

cct tcg tct tca tca tca tca ctt gtt gct tgt gga gaa aga aat ccg     432
Pro Ser Ser Ser Ser Ser Ser Leu Val Ala Cys Gly Glu Arg Asn Pro
    130                 135                 140

gaa acc ttg atc tcg aat cac gtg ttc tcc ctc cag aga ctt cta gag     480
Glu Thr Leu Ile Ser Asn His Val Phe Ser Leu Gln Arg Leu Leu Glu
145                 150                 155                 160

aac aaa tct tca tct ccc tca caa gaa agc aac gga aat aac agc cat     528
Asn Lys Ser Ser Ser Pro Ser Gln Glu Ser Asn Gly Asn Asn Ser His
                165                 170                 175

caa tgt tct tct gct cct gag att cca agg ctt ttc ttc tct gaa tgg     576
Gln Cys Ser Ser Ala Pro Glu Ile Pro Arg Leu Phe Phe Ser Glu Trp
            180                 185                 190
```

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ctt tct tct tca tat ccc cac acc gat tat tcc tct gag ttt acc gac      624
Leu Ser Ser Ser Tyr Pro His Thr Asp Tyr Ser Ser Glu Phe Thr Asp
        195                 200                 205

tct aag cac agt caa gct cca aat gtc gaa gag act ctc tca gct tat      672
Ser Lys His Ser Gln Ala Pro Asn Val Glu Glu Thr Leu Ser Ala Tyr
    210                 215                 220

gaa gaa atg ggt gat gtt gat cag ttc cat tac aac gaa atg atg atc      720
Glu Glu Met Gly Asp Val Asp Gln Phe His Tyr Asn Glu Met Met Ile
225                 230                 235                 240

aac aac agc aac tgg act ctt aac gac att gtg ttt ggt tcc aaa tgt      768
Asn Asn Ser Asn Trp Thr Leu Asn Asp Ile Val Phe Gly Ser Lys Cys
                245                 250                 255

aag aag cag gag cat cat att tat aga gag gct tca gat tgt aat tct      816
Lys Lys Gln Glu His His Ile Tyr Arg Glu Ala Ser Asp Cys Asn Ser
            260                 265                 270

tct gct gaa ttc ttt tct cca cca aca acg acg taa attgcgttta          862
Ser Ala Glu Phe Phe Ser Pro Pro Thr Thr Thr
        275                 280

ttgtaatgta aatcaaattt ctaaggcaaa accggaaaaa aaaaaaaaaa aaaaaaaa      920

<210>  368 <211>  283 <212>  PRT <213>  Arabidopsis thaliana  <400>  368

Met Ala Lys Thr Lys Tyr Gly Glu Arg His Arg Lys Gly Leu Trp Ser
1               5                   10                  15

Pro Glu Glu Asp Glu Lys Leu Arg Ser Phe Ile Leu Ser Tyr Gly His
            20                  25                  30

Ser Cys Trp Thr Thr Val Pro Ile Lys Ala Gly Leu Gln Arg Asn Gly
        35                  40                  45

Lys Ser Cys Arg Leu Arg Trp Ile Asn Tyr Leu Arg Pro Gly Leu Lys
    50                  55                  60

Arg Asp Met Ile Ser Ala Glu Glu Glu Glu Thr Ile Leu Thr Phe His
65                  70                  75                  80

Ser Pro Leu Gly Asn Lys Trp Ser Gln Ile Ala Lys Phe Leu Pro Gly
                85                  90                  95

Arg Thr Asp Asn Glu Ile Lys Asn Tyr Trp His Ser His Leu Lys Lys
            100                 105                 110
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Lys Trp Leu Lys Ser Gln Ser Leu Gln Asp Ala Lys Ser Ile Ser Pro
115 120 125

Pro Ser Ser Ser Ser Ser Ser Leu Val Ala Cys Gly Glu Arg Asn Pro
130 135 140

Glu Thr Leu Ile Ser Asn His Val Phe Ser Leu Gln Arg Leu Leu Glu
145 150 155 160

Asn Lys Ser Ser Ser Pro Ser Gln Glu Ser Asn Gly Asn Asn Ser His
165 170 175

Gln Cys Ser Ser Ala Pro Glu Ile Pro Arg Leu Phe Phe Ser Glu Trp
180 185 190

Leu Ser Ser Ser Tyr Pro His Thr Asp Tyr Ser Ser Glu Phe Thr Asp
195 200 205

Ser Lys His Ser Gln Ala Pro Asn Val Glu Glu Thr Leu Ser Ala Tyr
210 215 220

Glu Glu Met Gly Asp Val Asp Gln Phe His Tyr Asn Glu Met Met Ile
225 230 235 240

Asn Asn Ser Asn Trp Thr Leu Asn Asp Ile Val Phe Gly Ser Lys Cys
245 250 255

Lys Lys Gln Glu His His Ile Tyr Arg Glu Ala Ser Asp Cys Asn Ser
260 265 270

Ser Ala Glu Phe Phe Ser Pro Pro Thr Thr Thr
275 280

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<222> (1)..(723) <223> G342

<400> 369
atg gac gtc tac ggc atg tct tca ccg gac ttg ctt cgt atc gac gac 48
Met Asp Val Tyr Gly Met Ser Ser Pro Asp Leu Leu Arg Ile Asp Asp
1 5 10 15

ctt ctc gat ttc tcc aac gac gaa atc ttc tct tcc tct tcc acc gtc 96
Leu Leu Asp Phe Ser Asn Asp Glu Ile Phe Ser Ser Ser Ser Thr Val
20 25 30

act tcc tcc gcc gct tcc tcc gcc gct tct tcc gaa aac cct ttc agc 144

```
Thr Ser Ser Ala Ala Ser Ser Ala Ala Ser Ser Glu Asn Pro Phe Ser
        35                  40                  45

ttt cct tct tcc acc tac act tct cct act ctc ctc acc gac ttc act      192
Phe Pro Ser Ser Thr Tyr Thr Ser Pro Thr Leu Leu Thr Asp Phe Thr
    50                  55                  60

cac gat ctc tgc gtt ccc agt gac gac gca gct cat ctc gaa tgg tta      240
His Asp Leu Cys Val Pro Ser Asp Asp Ala Ala His Leu Glu Trp Leu
65                  70                  75                  80

tcg cga ttc gtt gac gat tca ttc tcc gat ttc cca gca aat cct tta      288
Ser Arg Phe Val Asp Asp Ser Phe Ser Asp Phe Pro Ala Asn Pro Leu
                85                  90                  95

acc atg acc gtt aga ccc gag att tca ttc acc gga aaa cct aga agt      336
Thr Met Thr Val Arg Pro Glu Ile Ser Phe Thr Gly Lys Pro Arg Ser
            100                 105                 110

cgc cga tca aga gca cca gca cct tcc gta gct gga act tgg gct ccg      384
Arg Arg Ser Arg Ala Pro Ala Pro Ser Val Ala Gly Thr Trp Ala Pro
        115                 120                 125

atg tct gaa tca gag ctt tgt cac tcc gtc gct aaa cct aaa ccg aag      432
Met Ser Glu Ser Glu Leu Cys His Ser Val Ala Lys Pro Lys Pro Lys
    130                 135                 140

aaa gtc tac aac gct gaa tcg gtt acg gcg gat gga gcg agg cgg tgc      480
Lys Val Tyr Asn Ala Glu Ser Val Thr Ala Asp Gly Ala Arg Arg Cys
145                 150                 155                 160

acg cac tgt gcc tcg gag aaa acg cca cag tgg aga act gga ccg ctt      528
Thr His Cys Ala Ser Glu Lys Thr Pro Gln Trp Arg Thr Gly Pro Leu
                165                 170                 175

gga cct aaa aca ctt tgt aac gct tgt gga gtt cgt tac aaa tca ggg      576
Gly Pro Lys Thr Leu Cys Asn Ala Cys Gly Val Arg Tyr Lys Ser Gly
            180                 185                 190

agg ctt gta ccg gaa tac aga ccg gcg tcg agt ccg acg ttt gta ttg      624
Arg Leu Val Pro Glu Tyr Arg Pro Ala Ser Ser Pro Thr Phe Val Leu
        195                 200                 205

act cag cat tcg aac tct cat cgg aaa gtt atg gag ctc cgg cga cag      672
Thr Gln His Ser Asn Ser His Arg Lys Val Met Glu Leu Arg Arg Gln
    210                 215                 220

aag gaa caa caa gaa tct tgc gtt cga att ccg ccg ttt cag ccg cag      720
Lys Glu Gln Gln Glu Ser Cys Val Arg Ile Pro Pro Phe Gln Pro Gln
225                 230                 235                 240

taa                                                                 723

<210>  370 <211>  240 <212>  PRT <213>  Arabidopsis thaliana  <400>  370

Met Asp Val Tyr Gly Met Ser Ser Pro Asp Leu Leu Arg Ile Asp Asp
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1               5                   10                  15

Leu Leu Asp Phe Ser Asn Asp Glu Ile Phe Ser Ser Ser Ser Thr Val
            20                  25                  30

Thr Ser Ser Ala Ala Ser Ser Ala Ala Ser Ser Glu Asn Pro Phe Ser
        35                  40                  45

Phe Pro Ser Ser Thr Tyr Thr Ser Pro Thr Leu Leu Thr Asp Phe Thr
    50                  55                  60

His Asp Leu Cys Val Pro Ser Asp Asp Ala Ala His Leu Glu Trp Leu
65                  70                  75                  80

Ser Arg Phe Val Asp Asp Ser Phe Ser Asp Phe Pro Ala Asn Pro Leu
                85                  90                  95

Thr Met Thr Val Arg Pro Glu Ile Ser Phe Thr Gly Lys Pro Arg Ser
            100                 105                 110

Arg Arg Ser Arg Ala Pro Ala Pro Ser Val Ala Gly Thr Trp Ala Pro
        115                 120                 125

Met Ser Glu Ser Glu Leu Cys His Ser Val Ala Lys Pro Lys Pro Lys
    130                 135                 140

Lys Val Tyr Asn Ala Glu Ser Val Thr Ala Asp Gly Ala Arg Arg Cys
145                 150                 155                 160

Thr His Cys Ala Ser Glu Lys Thr Pro Gln Trp Arg Thr Gly Pro Leu
                165                 170                 175

Gly Pro Lys Thr Leu Cys Asn Ala Cys Gly Val Arg Tyr Lys Ser Gly
            180                 185                 190

Arg Leu Val Pro Glu Tyr Arg Pro Ala Ser Ser Pro Thr Phe Val Leu
        195                 200                 205

Thr Gln His Ser Asn Ser His Arg Lys Val Met Glu Leu Arg Arg Gln
    210                 215                 220

Lys Glu Gln Gln Glu Ser Cys Val Arg Ile Pro Pro Phe Gln Pro Gln
225                 230                 235                 240
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<210> 371 <211> 932 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (43)..(759) <223> G350

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Met Ala Leu Glu
1

act ctt act tct cca aga tta tct tct ccg atg ccg act ctg ttt caa 102
Thr Leu Thr Ser Pro Arg Leu Ser Ser Pro Met Pro Thr Leu Phe Gln
5 10 15 20

gat tca gca cta ggg ttt cat gga agc aaa ggc aaa cga tct aag cga 150
Asp Ser Ala Leu Gly Phe His Gly Ser Lys Gly Lys Arg Ser Lys Arg
25 30 35

tca aga tct gaa ttc gac cgt cag agt ctc acg gag gat gaa tat atc 198
Ser Arg Ser Glu Phe Asp Arg Gln Ser Leu Thr Glu Asp Glu Tyr Ile
40 45 50

gct tta tgt ctc atg ctt ctt gct cgc gac gga gat aga aac cgt gac 246
Ala Leu Cys Leu Met Leu Leu Ala Arg Asp Gly Asp Arg Asn Arg Asp
55 60 65

ctt gac ctg cct tct tct tcg tct tca cct cct ctg ctt cct cct ctt 294
Leu Asp Leu Pro Ser Ser Ser Ser Ser Pro Pro Leu Leu Pro Pro Leu
70 75 80

cct act ccg atc tac aag tgt agc gtc tgt gac aag gcg ttt tcg tct 342
Pro Thr Pro Ile Tyr Lys Cys Ser Val Cys Asp Lys Ala Phe Ser Ser
85 90 95 100

tac cag gct ctt ggt gga cac aag gca agt cac cgg aaa agc ttt tcg 390
Tyr Gln Ala Leu Gly Gly His Lys Ala Ser His Arg Lys Ser Phe Ser
105 110 115

ctt act caa tct gcc gga gga gat gag ctg tcg aca tcg tcg gcg ata 438
Leu Thr Gln Ser Ala Gly Gly Asp Glu Leu Ser Thr Ser Ser Ala Ile
120 125 130

acc acg tct ggt ata tcc ggt ggc ggg gga gga agt gtg aag tcg cac 486
Thr Thr Ser Gly Ile Ser Gly Gly Gly Gly Gly Ser Val Lys Ser His
135 140 145

gtt tgc tct atc tgt cat aaa tcg ttc gcc acc ggt caa gct ctc ggc 534
Val Cys Ser Ile Cys His Lys Ser Phe Ala Thr Gly Gln Ala Leu Gly
150 155 160

ggc cac aaa cgg tgc cac tac gaa gga aag aac gga ggc ggt gtg agt 582
Gly His Lys Arg Cys His Tyr Glu Gly Lys Asn Gly Gly Gly Val Ser
165 170 175 180

agt agc gtg tcg aat tct gaa gat gtg ggg tct aca agc cac gtc agc 630
Ser Ser Val Ser Asn Ser Glu Asp Val Gly Ser Thr Ser His Val Ser
185 190 195

agt ggc cac cgt ggg ttt gac ctc aac ata ccg ccg ata ccg gaa ttc 678
Ser Gly His Arg Gly Phe Asp Leu Asn Ile Pro Pro Ile Pro Glu Phe
200 205 210

tcg atg gtc aac gga gac gaa gag gtg atg agt cct atg ccg gcg aag 726
Ser Met Val Asn Gly Asp Glu Glu Val Met Ser Pro Met Pro Ala Lys
215 220 225

aaa ctc cgg ttt gac ttc ccg gag aaa ccc taa acataaacct aggaaaaact 779
Lys Leu Arg Phe Asp Phe Pro Glu Lys Pro
230 235

ttacagaatt cattttatag gaaattgttt tactgtatat acaaatatcg attttgattg 839

atgttcttct tcactgaaaa attatgattc tttgttgtat aattgatgtt tctgaaaaag 899

atataacttt ttattaaaaa aaaaaaaaaa aaa 932

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Met Ala Leu Glu Thr Leu Thr Ser Pro Arg Leu Ser Ser Pro Met Pro
1 5 10 15

Thr Leu Phe Gln Asp Ser Ala Leu Gly Phe His Gly Ser Lys Gly Lys
20 25 30

Arg Ser Lys Arg Ser Arg Ser Glu Phe Asp Arg Gln Ser Leu Thr Glu
35 40 45

Asp Glu Tyr Ile Ala Leu Cys Leu Met Leu Leu Ala Arg Asp Gly Asp
50 55 60

Arg Asn Arg Asp Leu Asp Leu Pro Ser Ser Ser Ser Ser Pro Pro Leu
65 70 75 80

Leu Pro Pro Leu Pro Thr Pro Ile Tyr Lys Cys Ser Val Cys Asp Lys
85 90 95

Ala Phe Ser Ser Tyr Gln Ala Leu Gly Gly His Lys Ala Ser His Arg
100 105 110

Lys Ser Phe Ser Leu Thr Gln Ser Ala Gly Gly Asp Glu Leu Ser Thr
115 120 125

Ser Ser Ala Ile Thr Thr Ser Gly Ile Ser Gly Gly Gly Gly Gly Ser
130 135 140

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Val Lys Ser His Val Cys Ser Ile Cys His Lys Ser Phe Ala Thr Gly
145                 150                 155                 160

Gln Ala Leu Gly Gly His Lys Arg Cys His Tyr Glu Gly Lys Asn Gly
                165                 170                 175

Gly Gly Val Ser Ser Ser Val Ser Asn Ser Glu Asp Val Gly Ser Thr
            180                 185                 190

Ser His Val Ser Ser Gly His Arg Gly Phe Asp Leu Asn Ile Pro Pro
        195                 200                 205

Ile Pro Glu Phe Ser Met Val Asn Gly Asp Glu Glu Val Met Ser Pro
    210                 215                 220

Met Pro Ala Lys Lys Leu Arg Phe Asp Phe Pro Glu Lys Pro
225                 230                 235
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atccaccggt tatgtcttga ccggctttaa gcctataaac tgatgcccta agacaccttt    120

ttaggtttct caataattct ccgcatctat cttttcttct ccacaagtaa gggaaccaga    180

aaaccaggga agaatccgag caagctaggg tttcattgtg tgcacaaaat gggatataca    240

ggcagaagaa aatcgagata aatcaactaa atgatttgga taatcatctt gaagatttga    300

aggatttcga gactaagtcc ggcgcagaag tcacc atg gag aat cct tta gaa        353
                                        Met Glu Asn Pro Leu Glu
                                        1               5

gaa gag ctt caa gat cct aat cag cgt ccc aac aaa aag aag cgt tac       401
Glu Glu Leu Gln Asp Pro Asn Gln Arg Pro Asn Lys Lys Lys Arg Tyr
            10                  15                  20

cac cgt cac aca caa cgc cag att caa gag cta gag tcg ttc ttc aag       449
His Arg His Thr Gln Arg Gln Ile Gln Glu Leu Glu Ser Phe Phe Lys
        25                  30                  35

gaa tgt cct cat cca gac gat aag caa aga aag gag ctg agt cgc gag       497
Glu Cys Pro His Pro Asp Asp Lys Gln Arg Lys Glu Leu Ser Arg Glu
    40                  45                  50

cta agc tta gaa cct ctt caa gtc aag ttc tgg ttc caa aac aaa cgc       545
Leu Ser Leu Glu Pro Leu Gln Val Lys Phe Trp Phe Gln Asn Lys Arg
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55                  60                  65                  70

act caa atg aag gca caa cat gag agg cac gag aac cag ata ctg aag      593
Thr Gln Met Lys Ala Gln His Glu Arg His Glu Asn Gln Ile Leu Lys
                75                  80                  85

tca gaa aat gac aag ctc cga gca gag aac aat agg tac aag gat gct      641
Ser Glu Asn Asp Lys Leu Arg Ala Glu Asn Asn Arg Tyr Lys Asp Ala
            90                  95                  100

cta agc aac gca aca tgc cca aac tgt ggt ggt ccg gca gct ata gga      689
Leu Ser Asn Ala Thr Cys Pro Asn Cys Gly Gly Pro Ala Ala Ile Gly
        105                 110                 115

gaa atg tcc ttc gac gaa cag cat tta agg atc gaa aat gct cgt tta      737
Glu Met Ser Phe Asp Glu Gln His Leu Arg Ile Glu Asn Ala Arg Leu
    120                 125                 130

cgc gaa gag att gac aga atc tct gcc ata gct gct aaa tac gta ggg      785
Arg Glu Glu Ile Asp Arg Ile Ser Ala Ile Ala Ala Lys Tyr Val Gly
135                 140                 145                 150

aag cct tta atg gct aat tcc tct tct ttc cct cag ctc tct tct tca      833
Lys Pro Leu Met Ala Asn Ser Ser Ser Phe Pro Gln Leu Ser Ser Ser
                155                 160                 165

cac cac att ccc tcg cgc tcg ctt gat ctt gaa gtt ggg aac ttt ggg      881
His His Ile Pro Ser Arg Ser Leu Asp Leu Glu Val Gly Asn Phe Gly
            170                 175                 180

aac aat aac aat agc cac act ggt ttc gtt ggg gaa atg ttt gga agc      929
Asn Asn Asn Asn Ser His Thr Gly Phe Val Gly Glu Met Phe Gly Ser
        185                 190                 195

agc gac att ttg agg tcg gtt tcg ata cct tct gag gct gat aag cct      977
Ser Asp Ile Leu Arg Ser Val Ser Ile Pro Ser Glu Ala Asp Lys Pro
    200                 205                 210

atg att gtt gag tta gct gtt gca gca atg gaa gag ctt gtg aga atg     1025
Met Ile Val Glu Leu Ala Val Ala Ala Met Glu Glu Leu Val Arg Met
215                 220                 225                 230

gct caa act ggt gat ccc tta tgg gtt tca agc gat aat tct gtt gag     1073
Ala Gln Thr Gly Asp Pro Leu Trp Val Ser Ser Asp Asn Ser Val Glu
                235                 240                 245

att ctc aat gaa gaa gag tat ttt agg acg ttt cct aga gga att gga     1121
Ile Leu Asn Glu Glu Glu Tyr Phe Arg Thr Phe Pro Arg Gly Ile Gly
            250                 255                 260

ccg aaa cct atc ggt ttg aga tca gaa gct tca aga gag tct act gtt     1169
Pro Lys Pro Ile Gly Leu Arg Ser Glu Ala Ser Arg Glu Ser Thr Val
        265                 270                 275

gtt atc atg aat cat atc aat ctc att gag att cta atg gat gtg aat     1217
Val Ile Met Asn His Ile Asn Leu Ile Glu Ile Leu Met Asp Val Asn
    280                 285                 290
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caa tgg tct agt gtg ttc tgc ggg att gta tca aga gca ttg act cta     1265
Gln Trp Ser Ser Val Phe Cys Gly Ile Val Ser Arg Ala Leu Thr Leu
295                 300                 305                 310

gaa gtt ctc tca act ggc gta cga ggg aac tac aat ggg gca ttg caa     1313
Glu Val Leu Ser Thr Gly Val Arg Gly Asn Tyr Asn Gly Ala Leu Gln
                315                 320                 325

gtg atg aca gca gag ttc caa gtc cca tcg ccg ctt gtc cct act cgt     1361
Val Met Thr Ala Glu Phe Gln Val Pro Ser Pro Leu Val Pro Thr Arg
            330                 335                 340

gag aac tac ttt gta agg tac tgt aaa cag cac agt gac ggt att tgg     1409
Glu Asn Tyr Phe Val Arg Tyr Cys Lys Gln His Ser Asp Gly Ile Trp
        345                 350                 355

gcg gtt gtg gat gtc tct ttg gac agc cta aga cca agt ccg atc act     1457
Ala Val Val Asp Val Ser Leu Asp Ser Leu Arg Pro Ser Pro Ile Thr
    360                 365                 370

aga agc aga aga aga ccc tct ggt tgt ctg att caa gaa ttg cag aat     1505
Arg Ser Arg Arg Arg Pro Ser Gly Cys Leu Ile Gln Glu Leu Gln Asn
375                 380                 385                 390

ggt tac tcc aag gtg aca tgg gta gag cat att gag gtg gat gat aga     1553
Gly Tyr Ser Lys Val Thr Trp Val Glu His Ile Glu Val Asp Asp Arg
                395                 400                 405

tcg gtt cac aac atg tat aaa ccg ttg gtt aat acc ggt tta gct ttc     1601
Ser Val His Asn Met Tyr Lys Pro Leu Val Asn Thr Gly Leu Ala Phe
            410                 415                 420

ggt gca aaa cgt tgg gtg gct aca ctt gac cgc caa tgt gag cgg ctc     1649
Gly Ala Lys Arg Trp Val Ala Thr Leu Asp Arg Gln Cys Glu Arg Leu
        425                 430                 435

gcc agt tcc atg gcc agc aac att ccg gct tgt gat ctt tcc gtg ata     1697
Ala Ser Ser Met Ala Ser Asn Ile Pro Ala Cys Asp Leu Ser Val Ile
    440                 445                 450

acg agt cct gag ggg aga aag agc atg ctg aaa cta gcg gag aga atg     1745
Thr Ser Pro Glu Gly Arg Lys Ser Met Leu Lys Leu Ala Glu Arg Met
455                 460                 465                 470

gtg atg agc ttc tgt acc gga gtc ggc gcg tca acc gcc gat gcc tgg     1793
Val Met Ser Phe Cys Thr Gly Val Gly Ala Ser Thr Ala Asp Ala Trp
                475                 480                 485

act aca ttg tcg acc aca gga tcc gac gac gtt cgg gtc atg acc cga     1841
Thr Thr Leu Ser Thr Thr Gly Ser Asp Asp Val Arg Val Met Thr Arg
            490                 495                 500

aag agc atg gat gat ccg gga aga cct cca ggc atc gtt ctc agc gcc     1889
Lys Ser Met Asp Asp Pro Gly Arg Pro Pro Gly Ile Val Leu Ser Ala
        505                 510                 515
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gct act tct ttc tgg atc cct gta gct cca aaa cga gtg ttc gat ttt     1937
Ala Thr Ser Phe Trp Ile Pro Val Ala Pro Lys Arg Val Phe Asp Phe
    520                 525                 530

ctc aga gat gaa aac tca aga agc gag tgg gat ata ctt tcc aat gga     1985
Leu Arg Asp Glu Asn Ser Arg Ser Glu Trp Asp Ile Leu Ser Asn Gly
535                 540                 545                 550

ggc ttg gtt caa gaa atg gct cat atc gca aat ggt cgt gat cct ggg     2033
Gly Leu Val Gln Glu Met Ala His Ile Ala Asn Gly Arg Asp Pro Gly
                555                 560                 565

aat agt gtc tcc ttg ctt cga gtc aat agt ggg aac tca ggg cag agc     2081
Asn Ser Val Ser Leu Leu Arg Val Asn Ser Gly Asn Ser Gly Gln Ser
            570                 575                 580

aac atg ttg atc tta caa gaa agt tgt acg gac gca tca ggg tcc tat     2129
Asn Met Leu Ile Leu Gln Glu Ser Cys Thr Asp Ala Ser Gly Ser Tyr
        585                 590                 595

gtg ata tac gca cca gtt gat ata ata gct atg aac gtt gtc ctg agt     2177
Val Ile Tyr Ala Pro Val Asp Ile Ile Ala Met Asn Val Val Leu Ser
    600                 605                 610

ggt ggt gat ccg gat tat gtc gct ttg tta cca tcc gga ttc gct att     2225
Gly Gly Asp Pro Asp Tyr Val Ala Leu Leu Pro Ser Gly Phe Ala Ile
615                 620                 625                 630

ttg ccg gat ggc tct gct aga gga gga gga ggt agt gct aat gcc agt     2273
Leu Pro Asp Gly Ser Ala Arg Gly Gly Gly Gly Ser Ala Asn Ala Ser
                635                 640                 645

gct gga gcc gga gtt gaa gga gga gga gag ggg aat aat ctt gaa gtg     2321
Ala Gly Ala Gly Val Glu Gly Gly Gly Glu Gly Asn Asn Leu Glu Val
            650                 655                 660

gtt act act act ggg agt tgt ggc ggt tca cta ctc aca gtt gcg ttt     2369
Val Thr Thr Thr Gly Ser Cys Gly Gly Ser Leu Leu Thr Val Ala Phe
        665                 670                 675

cag ata ctt gtt gac tct gtt cct acc gct aaa ctc tct ctc ggt tca     2417
Gln Ile Leu Val Asp Ser Val Pro Thr Ala Lys Leu Ser Leu Gly Ser
    680                 685                 690

gtt gct aca gtc aat agt ctg atc aaa tgc act gtc gag cgg att aaa     2465
Val Ala Thr Val Asn Ser Leu Ile Lys Cys Thr Val Glu Arg Ile Lys
695                 700                 705                 710

gcc gct ctg gcc tgc gac gga gcc taa tcgatgtttt cggaaggtaa           2512
Ala Ala Leu Ala Cys Asp Gly Ala
                715

gagtgaaagg ggaggtttag ggagtttatg ataatgtttg tgttcttttg gtttttaaag   2572

tcttttgaga ttctccaaag gaagtcaaga acgctccttt ttgcgtttaa tctcatttcc   2632

gcgtttgtta gcggacgggc caaagaaaga ggcttgagaa agaaaaggta aagaggttcg   2692
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ggtattgact tctgctggaa ccaaaaaaaa aggaatcggg tttgttgtgt ttcggcggtt 2752

tagcattttg cgttttcttt gttattattt atcattgact agtgaacagt ttagcgttct 2812

gcttttcgcg tctactgtga aactccttgt tattaagcca ctctagtggt actgtcatta 2872

tatattatga atctatgaaa ctgtgtttat tagtttgttt ctttaatcca aacttgagat 2932

tctcttct 2940

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Met Glu Asn Pro Leu Glu Glu Glu Leu Gln Asp Pro Asn Gln Arg Pro
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Asn Lys Lys Lys Arg Tyr His Arg His Thr Gln Arg Gln Ile Gln Glu
20 25 30

Leu Glu Ser Phe Phe Lys Glu Cys Pro His Pro Asp Asp Lys Gln Arg
35 40 45

Lys Glu Leu Ser Arg Glu Leu Ser Leu Glu Pro Leu Gln Val Lys Phe
50 55 60

Trp Phe Gln Asn Lys Arg Thr Gln Met Lys Ala Gln His Glu Arg His
65 70 75 80

Glu Asn Gln Ile Leu Lys Ser Glu Asn Asp Lys Leu Arg Ala Glu Asn
85 90 95

Asn Arg Tyr Lys Asp Ala Leu Ser Asn Ala Thr Cys Pro Asn Cys Gly
100 105 110

Gly Pro Ala Ala Ile Gly Glu Met Ser Phe Asp Glu Gln His Leu Arg
115 120 125

Ile Glu Asn Ala Arg Leu Arg Glu Glu Ile Asp Arg Ile Ser Ala Ile
130 135 140

Ala Ala Lys Tyr Val Gly Lys Pro Leu Met Ala Asn Ser Ser Ser Phe
145 150 155 160

Pro Gln Leu Ser Ser Ser His His Ile Pro Ser Arg Ser Leu Asp Leu
165 170 175

Glu Val Gly Asn Phe Gly Asn Asn Asn Asn Ser His Thr Gly Phe Val
180 185 190

Gly Glu Met Phe Gly Ser Ser Asp Ile Leu Arg Ser Val Ser Ile Pro
195 200 205

Ser Glu Ala Asp Lys Pro Met Ile Val Glu Leu Ala Val Ala Ala Met
210 215 220

Glu Glu Leu Val Arg Met Ala Gln Thr Gly Asp Pro Leu Trp Val Ser
225 230 235 240

Ser Asp Asn Ser Val Glu Ile Leu Asn Glu Glu Glu Tyr Phe Arg Thr
245 250 255

Phe Pro Arg Gly Ile Gly Pro Lys Pro Ile Gly Leu Arg Ser Glu Ala
260 265 270

Ser Arg Glu Ser Thr Val Val Ile Met Asn His Ile Asn Leu Ile Glu
275 280 285

Ile Leu Met Asp Val Asn Gln Trp Ser Ser Val Phe Cys Gly Ile Val
290 295 300

Ser Arg Ala Leu Thr Leu Glu Val Leu Ser Thr Gly Val Arg Gly Asn
305 310 315 320

Tyr Asn Gly Ala Leu Gln Val Met Thr Ala Glu Phe Gln Val Pro Ser
325 330 335

Pro Leu Val Pro Thr Arg Glu Asn Tyr Phe Val Arg Tyr Cys Lys Gln
340 345 350

His Ser Asp Gly Ile Trp Ala Val Val Asp Val Ser Leu Asp Ser Leu
355 360 365

Arg Pro Ser Pro Ile Thr Arg Ser Arg Arg Arg Pro Ser Gly Cys Leu
370 375 380

Ile Gln Glu Leu Gln Asn Gly Tyr Ser Lys Val Thr Trp Val Glu His
385 390 395 400

Ile Glu Val Asp Asp Arg Ser Val His Asn Met Tyr Lys Pro Leu Val
405 410 415

Asn Thr Gly Leu Ala Phe Gly Ala Lys Arg Trp Val Ala Thr Leu Asp
420 425 430

Arg Gln Cys Glu Arg Leu Ala Ser Ser Met Ala Ser Asn Ile Pro Ala
435 440 445

Cys Asp Leu Ser Val Ile Thr Ser Pro Glu Gly Arg Lys Ser Met Leu
450 455 460

Lys Leu Ala Glu Arg Met Val Met Ser Phe Cys Thr Gly Val Gly Ala
465 470 475 480

Ser Thr Ala Asp Ala Trp Thr Thr Leu Ser Thr Thr Gly Ser Asp Asp
485 490 495

Val Arg Val Met Thr Arg Lys Ser Met Asp Asp Pro Gly Arg Pro Pro
500 505 510

Gly Ile Val Leu Ser Ala Ala Thr Ser Phe Trp Ile Pro Val Ala Pro
515 520 525

Lys Arg Val Phe Asp Phe Leu Arg Asp Glu Asn Ser Arg Ser Glu Trp
530 535 540

Asp Ile Leu Ser Asn Gly Gly Leu Val Gln Glu Met Ala His Ile Ala
545 550 555 560

Asn Gly Arg Asp Pro Gly Asn Ser Val Ser Leu Leu Arg Val Asn Ser
565 570 575

Gly Asn Ser Gly Gln Ser Asn Met Leu Ile Leu Gln Glu Ser Cys Thr
580 585 590

Asp Ala Ser Gly Ser Tyr Val Ile Tyr Ala Pro Val Asp Ile Ile Ala
595 600 605

Met Asn Val Val Leu Ser Gly Gly Asp Pro Asp Tyr Val Ala Leu Leu
610 615 620

Pro Ser Gly Phe Ala Ile Leu Pro Asp Gly Ser Ala Arg Gly Gly Gly

625 630 635 640

Gly Ser Ala Asn Ala Ser Ala Gly Ala Gly Val Glu Gly Gly Gly Glu
645 650 655

Gly Asn Asn Leu Glu Val Val Thr Thr Thr Gly Ser Cys Gly Gly Ser
660 665 670

Leu Leu Thr Val Ala Phe Gln Ile Leu Val Asp Ser Val Pro Thr Ala
675 680 685

Lys Leu Ser Leu Gly Ser Val Ala Thr Val Asn Ser Leu Ile Lys Cys
690 695 700

Thr Val Glu Arg Ile Lys Ala Ala Leu Ala Cys Asp Gly Ala
705 710 715

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tagtgggttt ttgttgttgt tgttgtggtc tctctg atg att act gaa ctt gag 234
Met Ile Thr Glu Leu Glu
1 5

atg ggg aaa ggt gag agt gag ctt gag ctt ggt cta ggg ctg agt ctt 282
Met Gly Lys Gly Glu Ser Glu Leu Glu Leu Gly Leu Gly Leu Ser Leu
10 15 20

ggc ggt gga acg gcg gcc aag att ggt aaa tca ggt ggt ggt ggc gcg 330
Gly Gly Gly Thr Ala Ala Lys Ile Gly Lys Ser Gly Gly Gly Gly Ala
25 30 35

tgg gga gag cgt gga agg ctt ttg acg gct aag gat ttt cct tct gtt 378
Trp Gly Glu Arg Gly Arg Leu Leu Thr Ala Lys Asp Phe Pro Ser Val
40 45 50

ggt tct aaa cgt gct gct gat tct gct tct cat gct ggt tca tct cct 426
Gly Ser Lys Arg Ala Ala Asp Ser Ala Ser His Ala Gly Ser Ser Pro
55 60 65 70

cct cgt tca agt caa gtt gtt gga tgg cct cct ata ggg tca cac agg 474
Pro Arg Ser Ser Gln Val Val Gly Trp Pro Pro Ile Gly Ser His Arg
75 80 85

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atg aac agt ttg gtt aat aac caa gct aca aag tca gca aga gaa gaa      522
Met Asn Ser Leu Val Asn Asn Gln Ala Thr Lys Ser Ala Arg Glu Glu
          90                  95                  100

gaa gaa gct ggt aag aag aaa gtg aaa gat gat gaa cct aaa gat gtg      570
Glu Glu Ala Gly Lys Lys Lys Val Lys Asp Asp Glu Pro Lys Asp Val
        105                 110                 115

aca aag aaa gtg aat ggg aaa gta caa gtt gga ttt att aag gtg aac      618
Thr Lys Lys Val Asn Gly Lys Val Gln Val Gly Phe Ile Lys Val Asn
    120                 125                 130

atg gat gga gtt gct ata gga aga aaa gtg gat ttg aat gct cat tct      666
Met Asp Gly Val Ala Ile Gly Arg Lys Val Asp Leu Asn Ala His Ser
135                 140                 145                 150

tct tac gag aat ttg gcg caa aca ttg gaa gat atg ttc ttt cgc act      714
Ser Tyr Glu Asn Leu Ala Gln Thr Leu Glu Asp Met Phe Phe Arg Thr
                155                 160                 165

aat ccg ggt act gtc ggg tta acc agt cag ttc act aaa ccg ttg agg      762
Asn Pro Gly Thr Val Gly Leu Thr Ser Gln Phe Thr Lys Pro Leu Arg
            170                 175                 180

ctt tta gat gga tcg tct gag ttt gta ctt act tat gaa gat aag gaa      810
Leu Leu Asp Gly Ser Ser Glu Phe Val Leu Thr Tyr Glu Asp Lys Glu
        185                 190                 195

gga gat tgg atg ctt gtt ggt gat gtt cca tgg aga atg ttc atc aac      858
Gly Asp Trp Met Leu Val Gly Asp Val Pro Trp Arg Met Phe Ile Asn
    200                 205                 210

tcg gtg aaa agg cta cgt gtg atg aaa acc tct gaa gct aat gga ctc      906
Ser Val Lys Arg Leu Arg Val Met Lys Thr Ser Glu Ala Asn Gly Leu
215                 220                 225                 230

gct gca cga aat caa gaa cca aac gag aga cag cga aag cag ccg gtt      954
Ala Ala Arg Asn Gln Glu Pro Asn Glu Arg Gln Arg Lys Gln Pro Val
                235                 240                 245

tag atctcttttc gacgttacgg tgttacaggt tttatatttt ggggttttgc          1007

aagtctgaga tacttctgaa gcaagcataa gctagattga tcttatatcc agtttgtgta   1067

ttttcttggt tcttataatg gtttttactg gttttcttta gttttttttt ttgctgtctt   1127

ttaattttcg gttgcgattt cactatatac tatggatgga agagaatgct ctttatatct   1187

tttactacac tgtaaatatt tgaagcttat ctaatatcgt ttttaagggt taaaaaaccc   1247

tgacgtagcc tcgag                                                   1262
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20 25 30

Ser Gly Gly Gly Gly Ala Trp Gly Glu Arg Gly Arg Leu Leu Thr Ala
35 40 45

Lys Asp Phe Pro Ser Val Gly Ser Lys Arg Ala Ala Asp Ser Ala Ser
50 55 60

His Ala Gly Ser Ser Pro Pro Arg Ser Ser Gln Val Val Gly Trp Pro
65 70 75 80

Pro Ile Gly Ser His Arg Met Asn Ser Leu Val Asn Asn Gln Ala Thr
85 90 95

Lys Ser Ala Arg Glu Glu Glu Glu Ala Gly Lys Lys Lys Val Lys Asp
100 105 110

Asp Glu Pro Lys Asp Val Thr Lys Lys Val Asn Gly Lys Val Gln Val
115 120 125

Gly Phe Ile Lys Val Asn Met Asp Gly Val Ala Ile Gly Arg Lys Val
130 135 140

Asp Leu Asn Ala His Ser Ser Tyr Glu Asn Leu Ala Gln Thr Leu Glu
145 150 155 160

Asp Met Phe Phe Arg Thr Asn Pro Gly Thr Val Gly Leu Thr Ser Gln
165 170 175

Phe Thr Lys Pro Leu Arg Leu Leu Asp Gly Ser Ser Glu Phe Val Leu
180 185 190

Thr Tyr Glu Asp Lys Glu Gly Asp Trp Met Leu Val Gly Asp Val Pro
195 200 205

Trp Arg Met Phe Ile Asn Ser Val Lys Arg Leu Arg Val Met Lys Thr
210 215 220

Ser Glu Ala Asn Gly Leu Ala Ala Arg Asn Gln Glu Pro Asn Glu Arg
225 230 235 240

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Gln Arg Lys Gln Pro Val
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<222>  (1)..(2580) <223>  G470

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Met Ala Ser Ser Glu Val Ser Met Lys Gly Asn Arg Gly Gly Asp Asn
1               5                   10                  15

ttc tcc tcc tct ggt ttt agt gac cct aag gag act aga aat gtc tcc       96
Phe Ser Ser Ser Gly Phe Ser Asp Pro Lys Glu Thr Arg Asn Val Ser
            20                  25                  30

gtc gcc ggc gag ggg caa aaa agt aat tct acc cga tcc gct gcg gct      144
Val Ala Gly Glu Gly Gln Lys Ser Asn Ser Thr Arg Ser Ala Ala Ala
        35                  40                  45

gag cgt gct ttg gac cct gag gct gct ctt tac aga gag cta tgg cac      192
Glu Arg Ala Leu Asp Pro Glu Ala Ala Leu Tyr Arg Glu Leu Trp His
    50                  55                  60

gct tgt gct ggt ccg ctt gtg acg gtt cct aga caa gac gac cga gtc      240
Ala Cys Ala Gly Pro Leu Val Thr Val Pro Arg Gln Asp Asp Arg Val
65                  70                  75                  80

ttc tat ttt cct caa gga cac atc gag cag gtg gag gct tcg acg aac      288
Phe Tyr Phe Pro Gln Gly His Ile Glu Gln Val Glu Ala Ser Thr Asn
                85                  90                  95

cag gcg gca gaa caa cag atg cct ctc tat gat ctt ccg tca aag ctt      336
Gln Ala Ala Glu Gln Gln Met Pro Leu Tyr Asp Leu Pro Ser Lys Leu
            100                 105                 110

ctc tgt cga gtt att aat gta gat tta aag gca gag gca gat aca gat      384
Leu Cys Arg Val Ile Asn Val Asp Leu Lys Ala Glu Ala Asp Thr Asp
        115                 120                 125

gaa gtt tat gcg cag att act ctt ctt cct gag gct aat caa gac gag      432
Glu Val Tyr Ala Gln Ile Thr Leu Leu Pro Glu Ala Asn Gln Asp Glu
    130                 135                 140

aat gca att gag aaa gaa gcg cct ctt cct cca cct ccg agg ttc cag      480
Asn Ala Ile Glu Lys Glu Ala Pro Leu Pro Pro Pro Pro Arg Phe Gln
145                 150                 155                 160

gtg cat tcg ttc tgc aaa acc ttg act gca tcc gac aca agt aca cat      528
Val His Ser Phe Cys Lys Thr Leu Thr Ala Ser Asp Thr Ser Thr His
                165                 170                 175

ggt gga ttt tct gtt ctt agg cga cat gcg gat gaa tgt ctc cca cct      576
Gly Gly Phe Ser Val Leu Arg Arg His Ala Asp Glu Cys Leu Pro Pro
            180                 185                 190
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ctg gat atg tct cga cag cct ccc act caa gag tta gtt gca aag gat      624
Leu Asp Met Ser Arg Gln Pro Pro Thr Gln Glu Leu Val Ala Lys Asp
        195                 200                 205

ttg cat gca aat gag tgg cga ttc aga cat ata ttc cgg ggt caa cca      672
Leu His Ala Asn Glu Trp Arg Phe Arg His Ile Phe Arg Gly Gln Pro
    210                 215                 220

cgg agg cat ttg cta cag agt ggg tgg agt gtg ttt gtt agc tcc aaa      720
Arg Arg His Leu Leu Gln Ser Gly Trp Ser Val Phe Val Ser Ser Lys
225                 230                 235                 240

agg cta gtt gca ggc gat gcg ttt ata ttt cta agg ggc gag aat gga      768
Arg Leu Val Ala Gly Asp Ala Phe Ile Phe Leu Arg Gly Glu Asn Gly
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gaa tta aga gtt ggt gta agg cgt gcg atg cga caa caa gga aac gtg      816
Glu Leu Arg Val Gly Val Arg Arg Ala Met Arg Gln Gln Gly Asn Val
            260                 265                 270

ccg tct tct gtt ata tct agc cat agc atg cat ctt gga gta ctg gcc      864
Pro Ser Ser Val Ile Ser Ser His Ser Met His Leu Gly Val Leu Ala
        275                 280                 285

acc gca tgg cat gcc att tca aca ggg act atg ttt aca gtc tac tac      912
Thr Ala Trp His Ala Ile Ser Thr Gly Thr Met Phe Thr Val Tyr Tyr
    290                 295                 300

aaa ccc agg acg agc cca tct gag ttt att gtt ccg ttc gat cag tat      960
Lys Pro Arg Thr Ser Pro Ser Glu Phe Ile Val Pro Phe Asp Gln Tyr
305                 310                 315                 320

atg gag tct gtt aag aat aac tac tct att ggc atg aga ttc aaa atg     1008
Met Glu Ser Val Lys Asn Asn Tyr Ser Ile Gly Met Arg Phe Lys Met
                325                 330                 335

aga ttt gaa ggc gaa gag gct cct gag cag agg ttt act ggc aca atc     1056
Arg Phe Glu Gly Glu Glu Ala Pro Glu Gln Arg Phe Thr Gly Thr Ile
            340                 345                 350

gtt ggg att gaa gag tct gat cct act agg tgg cca aaa tca aag tgg     1104
Val Gly Ile Glu Glu Ser Asp Pro Thr Arg Trp Pro Lys Ser Lys Trp
        355                 360                 365

aga tcc ctc aag gtg aga tgg gat gag act tct agt att cct cga cct     1152
Arg Ser Leu Lys Val Arg Trp Asp Glu Thr Ser Ser Ile Pro Arg Pro
    370                 375                 380

gat aga gta tct ccg tgg aaa gta gag cca gct ctt gct cct cct gct     1200
Asp Arg Val Ser Pro Trp Lys Val Glu Pro Ala Leu Ala Pro Pro Ala
385                 390                 395                 400

ttg agt cct gtt cca atg cct agg cct aag agg ccc aga tca aat ata     1248
Leu Ser Pro Val Pro Met Pro Arg Pro Lys Arg Pro Arg Ser Asn Ile
                405                 410                 415

gca cct tca tct cct gac tct tcg atg ctt acc aga gaa ggt aca act     1296
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Ala Pro Ser Ser Pro Asp Ser Ser Met Leu Thr Arg Glu Gly Thr Thr
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aag gca aac atg gac cct tta cca gca agc gga ctt tca agg gtc ttg     1344
Lys Ala Asn Met Asp Pro Leu Pro Ala Ser Gly Leu Ser Arg Val Leu
        435                 440                 445

caa ggt caa gaa tac tcg acc ttg agg acg aaa cat act gag agt gta     1392
Gln Gly Gln Glu Tyr Ser Thr Leu Arg Thr Lys His Thr Glu Ser Val
    450                 455                 460

gag tgt gat gct cct gag aat tct gtt gtc tgg caa tct tca gcg gat     1440
Glu Cys Asp Ala Pro Glu Asn Ser Val Val Trp Gln Ser Ser Ala Asp
465                 470                 475                 480

gat gat aag gtt gac gtg gtt tcg ggt tct aga aga tat gga tct gag     1488
Asp Asp Lys Val Asp Val Val Ser Gly Ser Arg Arg Tyr Gly Ser Glu
                485                 490                 495

aac tgg atg tcc tca gcc agg cat gaa cct act tac aca gat ttg ctc     1536
Asn Trp Met Ser Ser Ala Arg His Glu Pro Thr Tyr Thr Asp Leu Leu
            500                 505                 510

tcc ggc ttt ggg act aac ata gat cca tcc cat ggt cag cgg ata cct     1584
Ser Gly Phe Gly Thr Asn Ile Asp Pro Ser His Gly Gln Arg Ile Pro
        515                 520                 525

ttt tat gac cat tca tca tca cct tct atg cct gca aag aga atc ttg     1632
Phe Tyr Asp His Ser Ser Ser Pro Ser Met Pro Ala Lys Arg Ile Leu
    530                 535                 540

agt gat tca gaa ggc aag ttc gat tat ctt gct aac cag tgg cag atg     1680
Ser Asp Ser Glu Gly Lys Phe Asp Tyr Leu Ala Asn Gln Trp Gln Met
545                 550                 555                 560

ata cac tct ggt ctc tcc ctg aag tta cat gaa tct cct aag gta cct     1728
Ile His Ser Gly Leu Ser Leu Lys Leu His Glu Ser Pro Lys Val Pro
                565                 570                 575

gca gca act gat gcg tct ctc caa ggg cga tgc aat gtt aaa tac agc     1776
Ala Ala Thr Asp Ala Ser Leu Gln Gly Arg Cys Asn Val Lys Tyr Ser
            580                 585                 590

gaa tat cct gtt ctt aat ggt cta tcg act gag aat gct ggt ggt aac     1824
Glu Tyr Pro Val Leu Asn Gly Leu Ser Thr Glu Asn Ala Gly Gly Asn
        595                 600                 605

tgg cca ata cgt cca cgt gct ttg aat tat tat gag gaa gtg gtc aat     1872
Trp Pro Ile Arg Pro Arg Ala Leu Asn Tyr Tyr Glu Glu Val Val Asn
    610                 615                 620

gct caa gcg caa gct cag gct agg gag caa gta aca aaa caa ccc ttc     1920
Ala Gln Ala Gln Ala Gln Ala Arg Glu Gln Val Thr Lys Gln Pro Phe
625                 630                 635                 640

acg ata caa gag gag aca gca aag tca aga gaa ggg aac tgc agg ctc     1968
Thr Ile Gln Glu Glu Thr Ala Lys Ser Arg Glu Gly Asn Cys Arg Leu
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ttt ggc att cct ctg acc aac aac atg aat ggg aca gac tca acc atg     2016
Phe Gly Ile Pro Leu Thr Asn Asn Met Asn Gly Thr Asp Ser Thr Met
            660                 665                 670

tct cag aga aac aac ttg aat gat gct gcg ggg ctt aca cag ata gca     2064
Ser Gln Arg Asn Asn Leu Asn Asp Ala Ala Gly Leu Thr Gln Ile Ala
        675                 680                 685

tca cca aag gtt cag gac ctt tca gat cag tca aaa ggg tca aaa tca     2112
Ser Pro Lys Val Gln Asp Leu Ser Asp Gln Ser Lys Gly Ser Lys Ser
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aca aac gat cat cgt gaa cag gga aga cca ttc cag act aat aat cct     2160
Thr Asn Asp His Arg Glu Gln Gly Arg Pro Phe Gln Thr Asn Asn Pro
705                 710                 715                 720

cat ccg aag gat gct caa acg aaa acc aac tca agt agg agt tgc aca     2208
His Pro Lys Asp Ala Gln Thr Lys Thr Asn Ser Ser Arg Ser Cys Thr
                725                 730                 735

aag gtt cac aag cag gga att gca ctt ggc cgt tca gtg gat ctt tca     2256
Lys Val His Lys Gln Gly Ile Ala Leu Gly Arg Ser Val Asp Leu Ser
            740                 745                 750

aag ttc caa aac tat gag gag tta gtc gct gag ctg gac agg ctg ttt     2304
Lys Phe Gln Asn Tyr Glu Glu Leu Val Ala Glu Leu Asp Arg Leu Phe
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gag ttc aat gga gag ttg atg gct cct aag aaa gat tgg ttg ata gtt     2352
Glu Phe Asn Gly Glu Leu Met Ala Pro Lys Lys Asp Trp Leu Ile Val
    770                 775                 780

tac aca gat gaa gag aat gat atg atg ctt gtt ggt gac gat cct tgg     2400
Tyr Thr Asp Glu Glu Asn Asp Met Met Leu Val Gly Asp Asp Pro Trp
785                 790                 795                 800

cag gag ttt tgt tgc atg gtt cgc aaa atc ttc ata tac acg aaa gag     2448
Gln Glu Phe Cys Cys Met Val Arg Lys Ile Phe Ile Tyr Thr Lys Glu
                805                 810                 815

gaa gtg agg aag atg aac ccg ggg act tta agc tgt agg agc gag gaa     2496
Glu Val Arg Lys Met Asn Pro Gly Thr Leu Ser Cys Arg Ser Glu Glu
            820                 825                 830

gaa gca gtt gtt ggg gaa gga tca gat gca aag gac gcc aag tct gca     2544
Glu Ala Val Val Gly Glu Gly Ser Asp Ala Lys Asp Ala Lys Ser Ala
        835                 840                 845

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35 40 45

Glu Arg Ala Leu Asp Pro Glu Ala Ala Leu Tyr Arg Glu Leu Trp His
50 55 60

Ala Cys Ala Gly Pro Leu Val Thr Val Pro Arg Gln Asp Asp Arg Val
65 70 75 80

Phe Tyr Phe Pro Gln Gly His Ile Glu Gln Val Glu Ala Ser Thr Asn
85 90 95

Gln Ala Ala Glu Gln Gln Met Pro Leu Tyr Asp Leu Pro Ser Lys Leu
100 105 110

Leu Cys Arg Val Ile Asn Val Asp Leu Lys Ala Glu Ala Asp Thr Asp
115 120 125

Glu Val Tyr Ala Gln Ile Thr Leu Leu Pro Glu Ala Asn Gln Asp Glu
130 135 140

Asn Ala Ile Glu Lys Glu Ala Pro Leu Pro Pro Pro Pro Arg Phe Gln
145 150 155 160

Val His Ser Phe Cys Lys Thr Leu Thr Ala Ser Asp Thr Ser Thr His
165 170 175

Gly Gly Phe Ser Val Leu Arg Arg His Ala Asp Glu Cys Leu Pro Pro
180 185 190

Leu Asp Met Ser Arg Gln Pro Pro Thr Gln Glu Leu Val Ala Lys Asp
195 200 205

Leu His Ala Asn Glu Trp Arg Phe Arg His Ile Phe Arg Gly Gln Pro
210 215 220

Arg Arg His Leu Leu Gln Ser Gly Trp Ser Val Phe Val Ser Ser Lys

225 230 235 240

Arg Leu Val Ala Gly Asp Ala Phe Ile Phe Leu Arg Gly Glu Asn Gly
245 250 255

Glu Leu Arg Val Gly Val Arg Arg Ala Met Arg Gln Gln Gly Asn Val
260 265 270

Pro Ser Ser Val Ile Ser Ser His Ser Met His Leu Gly Val Leu Ala
275 280 285

Thr Ala Trp His Ala Ile Ser Thr Gly Thr Met Phe Thr Val Tyr Tyr
290 295 300

Lys Pro Arg Thr Ser Pro Ser Glu Phe Ile Val Pro Phe Asp Gln Tyr
305 310 315 320

Met Glu Ser Val Lys Asn Asn Tyr Ser Ile Gly Met Arg Phe Lys Met
325 330 335

Arg Phe Glu Gly Glu Glu Ala Pro Glu Gln Arg Phe Thr Gly Thr Ile
340 345 350

Val Gly Ile Glu Glu Ser Asp Pro Thr Arg Trp Pro Lys Ser Lys Trp
355 360 365

Arg Ser Leu Lys Val Arg Trp Asp Glu Thr Ser Ser Ile Pro Arg Pro
370 375 380

Asp Arg Val Ser Pro Trp Lys Val Glu Pro Ala Leu Ala Pro Pro Ala
385 390 395 400

Leu Ser Pro Val Pro Met Pro Arg Pro Lys Arg Pro Arg Ser Asn Ile
405 410 415

Ala Pro Ser Ser Pro Asp Ser Ser Met Leu Thr Arg Glu Gly Thr Thr
420 425 430

Lys Ala Asn Met Asp Pro Leu Pro Ala Ser Gly Leu Ser Arg Val Leu
435 440 445

Gln Gly Gln Glu Tyr Ser Thr Leu Arg Thr Lys His Thr Glu Ser Val
450 455 460

Glu Cys Asp Ala Pro Glu Asn Ser Val Val Trp Gln Ser Ser Ala Asp
465 470 475 480

Asp Asp Lys Val Asp Val Val Ser Gly Ser Arg Arg Tyr Gly Ser Glu
485 490 495

Asn Trp Met Ser Ser Ala Arg His Glu Pro Thr Tyr Thr Asp Leu Leu
500 505 510

Ser Gly Phe Gly Thr Asn Ile Asp Pro Ser His Gly Gln Arg Ile Pro
515 520 525

Phe Tyr Asp His Ser Ser Ser Pro Ser Met Pro Ala Lys Arg Ile Leu
530 535 540

Ser Asp Ser Glu Gly Lys Phe Asp Tyr Leu Ala Asn Gln Trp Gln Met
545 550 555 560

Ile His Ser Gly Leu Ser Leu Lys Leu His Glu Ser Pro Lys Val Pro
565 570 575

Ala Ala Thr Asp Ala Ser Leu Gln Gly Arg Cys Asn Val Lys Tyr Ser
580 585 590

Glu Tyr Pro Val Leu Asn Gly Leu Ser Thr Glu Asn Ala Gly Gly Asn
595 600 605

Trp Pro Ile Arg Pro Arg Ala Leu Asn Tyr Tyr Glu Glu Val Val Asn
610 615 620

Ala Gln Ala Gln Ala Gln Ala Arg Glu Gln Val Thr Lys Gln Pro Phe
625 630 635 640

Thr Ile Gln Glu Glu Thr Ala Lys Ser Arg Glu Gly Asn Cys Arg Leu
645 650 655

Phe Gly Ile Pro Leu Thr Asn Asn Met Asn Gly Thr Asp Ser Thr Met
660 665 670

Ser Gln Arg Asn Asn Leu Asn Asp Ala Ala Gly Leu Thr Gln Ile Ala
675 680 685

Ser Pro Lys Val Gln Asp Leu Ser Asp Gln Ser Lys Gly Ser Lys Ser
690 695 700

Thr Asn Asp His Arg Glu Gln Gly Arg Pro Phe Gln Thr Asn Asn Pro
705 710 715 720

His Pro Lys Asp Ala Gln Thr Lys Thr Asn Ser Ser Arg Ser Cys Thr
725 730 735

Lys Val His Lys Gln Gly Ile Ala Leu Gly Arg Ser Val Asp Leu Ser
740 745 750

Lys Phe Gln Asn Tyr Glu Glu Leu Val Ala Glu Leu Asp Arg Leu Phe
755 760 765

Glu Phe Asn Gly Glu Leu Met Ala Pro Lys Lys Asp Trp Leu Ile Val
770 775 780

Tyr Thr Asp Glu Glu Asn Asp Met Met Leu Val Gly Asp Asp Pro Trp
785 790 795 800

Gln Glu Phe Cys Cys Met Val Arg Lys Ile Phe Ile Tyr Thr Lys Glu
805 810 815

Glu Val Arg Lys Met Asn Pro Gly Thr Leu Ser Cys Arg Ser Glu Glu
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Ser Asn Pro Ser Leu Ser Ser Ala Gly Asn Ser
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aagaaaacgt ggagacggaa tccaagggac cttcttcttc aatttaattc ctcactttat 180

tacgcaccct tcttttattt tcgactgttt cagcttccgg ttcttcatcg gagagagata 240

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gagagactgt gtgttttggt gtgactgata gaagatttaa tcagctg atg gca aat      296
                                                      Met Ala Asn
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cgc gga ggt gaa tat ctg tac gat gag tta tgg aaa tta tgc gcg gga      344
Arg Gly Gly Glu Tyr Leu Tyr Asp Glu Leu Trp Lys Leu Cys Ala Gly
    5                   10                  15

cct ctt gtt gat gtt cct caa gct caa gaa aga gtt tat tat ttt cct      392
Pro Leu Val Asp Val Pro Gln Ala Gln Glu Arg Val Tyr Tyr Phe Pro
20                  25                  30                  35

caa ggt cac atg gaa caa ctc gaa gcg tca acg caa caa gtc gac tta      440
Gln Gly His Met Glu Gln Leu Glu Ala Ser Thr Gln Gln Val Asp Leu
                40                  45                  50

aat acg atg aag cct ctt ttt gtt ctt cct cct aag att ctc tgc aat      488
Asn Thr Met Lys Pro Leu Phe Val Leu Pro Pro Lys Ile Leu Cys Asn
            55                  60                  65

gtt atg aac gtt agt ctt cag gcg gag aaa gat acg gat gag gtc tat      536
Val Met Asn Val Ser Leu Gln Ala Glu Lys Asp Thr Asp Glu Val Tyr
        70                  75                  80

gct cag att act ttg atc cct gtt gga act gaa gtt gat gaa cct atg      584
Ala Gln Ile Thr Leu Ile Pro Val Gly Thr Glu Val Asp Glu Pro Met
    85                  90                  95

agt cct gat ccc tct cct cct gag ttg caa agg ccg aaa gtt cac tct      632
Ser Pro Asp Pro Ser Pro Pro Glu Leu Gln Arg Pro Lys Val His Ser
100                 105                 110                 115

ttc agc aag gtt ttg aca gcg tct gat aca agc acc cat ggt ggc ttt      680
Phe Ser Lys Val Leu Thr Ala Ser Asp Thr Ser Thr His Gly Gly Phe
                120                 125                 130

tct gtt cta agg aaa cat gcc acg gaa tgt ctt cct ccg ctg gat atg      728
Ser Val Leu Arg Lys His Ala Thr Glu Cys Leu Pro Pro Leu Asp Met
            135                 140                 145

act cag caa acc ccg acc cag gag tta gta gcc gaa gat gtg cac ggt      776
Thr Gln Gln Thr Pro Thr Gln Glu Leu Val Ala Glu Asp Val His Gly
        150                 155                 160

tat cag tgg aaa ttc aag cat att ttt aga ggc caa cca cgg agg cat      824
Tyr Gln Trp Lys Phe Lys His Ile Phe Arg Gly Gln Pro Arg Arg His
    165                 170                 175

cta ttg acg aca ggg tgg agc acc ttt gtt aca tca aag aga ttg gtt      872
Leu Leu Thr Thr Gly Trp Ser Thr Phe Val Thr Ser Lys Arg Leu Val
180                 185                 190                 195

gct ggg gac acc ttt gta ttc ctg aga ggg gag aac gga gag ttg cga      920
Ala Gly Asp Thr Phe Val Phe Leu Arg Gly Glu Asn Gly Glu Leu Arg
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gtt gga gtc aga cgt gct aat ctt caa cag agc agt atg cct tca tcc      968
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Val Gly Val Arg Arg Ala Asn Leu Gln Gln Ser Ser Met Pro Ser Ser
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gtt ata tca agt cat agt atg cat ctg gga gtg ctt gct act gca cgc     1016
Val Ile Ser Ser His Ser Met His Leu Gly Val Leu Ala Thr Ala Arg
        230                 235                 240

cat gct act caa acg aaa act atg ttc att gta tac tat aaa cca agg     1064
His Ala Thr Gln Thr Lys Thr Met Phe Ile Val Tyr Tyr Lys Pro Arg
    245                 250                 255

aca agc caa ttc atc att agc ttg aac aaa tat cta gaa gcc atg agc     1112
Thr Ser Gln Phe Ile Ile Ser Leu Asn Lys Tyr Leu Glu Ala Met Ser
260                 265                 270                 275

aat aag ttc tct gta ggg atg aga ttt aag atg cgt ttt gag gga gag     1160
Asn Lys Phe Ser Val Gly Met Arg Phe Lys Met Arg Phe Glu Gly Glu
                280                 285                 290

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Asp Ser Pro Glu Arg Arg Tyr Ser Gly Thr Val Ile Gly Val Lys Asp
            295                 300                 305

tgc tcc cct cac tgg aaa gac tca aaa tgg cga tgc tta gaa gtt cat     1256
Cys Ser Pro His Trp Lys Asp Ser Lys Trp Arg Cys Leu Glu Val His
        310                 315                 320

tgg gat gag cct gca tcg att tca aga ccc aat aag gtt tca cca tgg     1304
Trp Asp Glu Pro Ala Ser Ile Ser Arg Pro Asn Lys Val Ser Pro Trp
    325                 330                 335

gaa att gaa ccg ttt gta aat tca gaa aac gtt ccc aaa tca gtt atg     1352
Glu Ile Glu Pro Phe Val Asn Ser Glu Asn Val Pro Lys Ser Val Met
340                 345                 350                 355

ctg aag aac aaa agg ccc cgt caa gtt agt gaa gta tct gca ctt gat     1400
Leu Lys Asn Lys Arg Pro Arg Gln Val Ser Glu Val Ser Ala Leu Asp
                360                 365                 370

gta ggc ata aca gct tca aac ctt tgg agc tct gtt ttg acg caa ccc     1448
Val Gly Ile Thr Ala Ser Asn Leu Trp Ser Ser Val Leu Thr Gln Pro
            375                 380                 385

cat gag ttt gca caa tcg tgc atc acc tca cag tgg agt tct cct cag     1496
His Glu Phe Ala Gln Ser Cys Ile Thr Ser Gln Trp Ser Ser Pro Gln
        390                 395                 400

caa tgt cat cgt gat gca aat gag gat gct aag aaa tct gac tgg cta     1544
Gln Cys His Arg Asp Ala Asn Glu Asp Ala Lys Lys Ser Asp Trp Leu
    405                 410                 415

aat aac tct tac tct gtg tca aat gta gca aaa gac tca aca ctg aac     1592
Asn Asn Ser Tyr Ser Val Ser Asn Val Ala Lys Asp Ser Thr Leu Asn
420                 425                 430                 435

gac caa atg gtt tcc cca gtc gag cag aag aag cct gag aca acc gct     1640
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cct gag gag aaa act gca ccc atg cga cca atc aac ata tcc aaa ccg     1736
Pro Glu Glu Lys Thr Ala Pro Met Arg Pro Ile Asn Ile Ser Lys Pro
        470                 475                 480

act atg gac agc cac tca gac cca aaa tca gag att tca aaa gta tca     1784
Thr Met Asp Ser His Ser Asp Pro Lys Ser Glu Ile Ser Lys Val Ser
    485                 490                 495

gaa gag aaa aag cag gaa cct gcg gag gga tca cca aaa gag gtc caa     1832
Glu Glu Lys Lys Gln Glu Pro Ala Glu Gly Ser Pro Lys Glu Val Gln
500                 505                 510                 515

agc aag caa agc agt tct aca aga agc cgt acc aag gtg cag atg caa     1880
Ser Lys Gln Ser Ser Ser Thr Arg Ser Arg Thr Lys Val Gln Met Gln
                520                 525                 530

ggc gta cct gtg ggc agg gct gtg gat tta aat gcg cta aag ggg tac     1928
Gly Val Pro Val Gly Arg Ala Val Asp Leu Asn Ala Leu Lys Gly Tyr
            535                 540                 545

aac gag ctc ata gat gac att gag aag ctg ttt gac ata aaa ggg gaa     1976
Asn Glu Leu Ile Asp Asp Ile Glu Lys Leu Phe Asp Ile Lys Gly Glu
        550                 555                 560

ctg cgg agt cgc aat caa tgg gaa ata gtg ttc aca gac gat gag gga     2024
Leu Arg Ser Arg Asn Gln Trp Glu Ile Val Phe Thr Asp Asp Glu Gly
    565                 570                 575

gat atg atg ctt gtc ggt gat gac cca tgg cct gag ttc tgc aac atg     2072
Asp Met Met Leu Val Gly Asp Asp Pro Trp Pro Glu Phe Cys Asn Met
580                 585                 590                 595

gtg aag aga ata ttc ata tgg tcg aaa gag gaa gtg aag aaa atg acg     2120
Val Lys Arg Ile Phe Ile Trp Ser Lys Glu Glu Val Lys Lys Met Thr
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Pro Gly Asn Gln Leu Arg Met Leu Leu Arg Glu Val Glu Thr Thr Leu
            615                 620                 625

aca aca act tcc aaa aca gat aat cat tcc aac taa ttttattct           2214
Thr Thr Thr Ser Lys Thr Asp Asn His Ser Asn
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35 40 45

Val Asp Leu Asn Thr Met Lys Pro Leu Phe Val Leu Pro Pro Lys Ile
50 55 60

Leu Cys Asn Val Met Asn Val Ser Leu Gln Ala Glu Lys Asp Thr Asp
65 70 75 80

Glu Val Tyr Ala Gln Ile Thr Leu Ile Pro Val Gly Thr Glu Val Asp
85 90 95

Glu Pro Met Ser Pro Asp Pro Ser Pro Pro Glu Leu Gln Arg Pro Lys
100 105 110

Val His Ser Phe Ser Lys Val Leu Thr Ala Ser Asp Thr Ser Thr His
115 120 125

Gly Gly Phe Ser Val Leu Arg Lys His Ala Thr Glu Cys Leu Pro Pro
130 135 140

Leu Asp Met Thr Gln Gln Thr Pro Thr Gln Glu Leu Val Ala Glu Asp
145 150 155 160

Val His Gly Tyr Gln Trp Lys Phe Lys His Ile Phe Arg Gly Gln Pro
165 170 175

Arg Arg His Leu Leu Thr Thr Gly Trp Ser Thr Phe Val Thr Ser Lys
180 185 190

Arg Leu Val Ala Gly Asp Thr Phe Val Phe Leu Arg Gly Glu Asn Gly
195 200 205

Glu Leu Arg Val Gly Val Arg Arg Ala Asn Leu Gln Gln Ser Ser Met
210 215 220

Pro Ser Ser Val Ile Ser Ser His Ser Met His Leu Gly Val Leu Ala

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225                 230                 235                 240

Thr Ala Arg His Ala Thr Gln Thr Lys Thr Met Phe Ile Val Tyr Tyr
                245                 250                 255

Lys Pro Arg Thr Ser Gln Phe Ile Ile Ser Leu Asn Lys Tyr Leu Glu
            260                 265                 270

Ala Met Ser Asn Lys Phe Ser Val Gly Met Arg Phe Lys Met Arg Phe
        275                 280                 285

Glu Gly Glu Asp Ser Pro Glu Arg Arg Tyr Ser Gly Thr Val Ile Gly
    290                 295                 300

Val Lys Asp Cys Ser Pro His Trp Lys Asp Ser Lys Trp Arg Cys Leu
305                 310                 315                 320

Glu Val His Trp Asp Glu Pro Ala Ser Ile Ser Arg Pro Asn Lys Val
                325                 330                 335

Ser Pro Trp Glu Ile Glu Pro Phe Val Asn Ser Glu Asn Val Pro Lys
            340                 345                 350

Ser Val Met Leu Lys Asn Lys Arg Pro Arg Gln Val Ser Glu Val Ser
        355                 360                 365

Ala Leu Asp Val Gly Ile Thr Ala Ser Asn Leu Trp Ser Ser Val Leu
    370                 375                 380

Thr Gln Pro His Glu Phe Ala Gln Ser Cys Ile Thr Ser Gln Trp Ser
385                 390                 395                 400

Ser Pro Gln Gln Cys His Arg Asp Ala Asn Glu Asp Ala Lys Lys Ser
                405                 410                 415

Asp Trp Leu Asn Asn Ser Tyr Ser Val Ser Asn Val Ala Lys Asp Ser
            420                 425                 430

Thr Leu Asn Asp Gln Met Val Ser Pro Val Glu Gln Lys Lys Pro Glu
        435                 440                 445

Thr Thr Ala Asn Tyr Arg Leu Phe Gly Ile Asp Leu Met Ser Ser Ser
    450                 455                 460
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Leu Ala Val Pro Glu Glu Lys Thr Ala Pro Met Arg Pro Ile Asn Ile
465 470 475 480

Ser Lys Pro Thr Met Asp Ser His Ser Asp Pro Lys Ser Glu Ile Ser
485 490 495

Lys Val Ser Glu Glu Lys Lys Gln Glu Pro Ala Glu Gly Ser Pro Lys
500 505 510

Glu Val Gln Ser Lys Gln Ser Ser Ser Thr Arg Ser Arg Thr Lys Val
515 520 525

Gln Met Gln Gly Val Pro Val Gly Arg Ala Val Asp Leu Asn Ala Leu
530 535 540

Lys Gly Tyr Asn Glu Leu Ile Asp Asp Ile Glu Lys Leu Phe Asp Ile
545 550 555 560

Lys Gly Glu Leu Arg Ser Arg Asn Gln Trp Glu Ile Val Phe Thr Asp
565 570 575

Asp Glu Gly Asp Met Met Leu Val Gly Asp Asp Pro Trp Pro Glu Phe
580 585 590

Cys Asn Met Val Lys Arg Ile Phe Ile Trp Ser Lys Glu Glu Val Lys
595 600 605

Lys Met Thr Pro Gly Asn Gln Leu Arg Met Leu Leu Arg Glu Val Glu
610 615 620

Thr Thr Leu Thr Thr Thr Ser Lys Thr Asp Asn His Ser Asn
625 630 635

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cctcaagcta agattctggt tttgtgagtt gagtggatga gaagaggaga gattaactaa 120

attagggttt caattgttta ctttttgttt gctttttata tcaagta atg gat cag 176
Met Asp Gln
1

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gtc tct cgc tct ctt cct cca cct ttt ctc tca aga gat ctc cat ctt      224
Val Ser Arg Ser Leu Pro Pro Pro Phe Leu Ser Arg Asp Leu His Leu
    5                   10                  15

cac cca cac cat caa ttc cag cat cag cag cag cag cag caa cag aat      272
His Pro His His Gln Phe Gln His Gln Gln Gln Gln Gln Gln Gln Asn
20                  25                  30                  35

cac ggc cac gat ata gac cag cac cga atc ggt ggg cta aaa cgt gac      320
His Gly His Asp Ile Asp Gln His Arg Ile Gly Gly Leu Lys Arg Asp
                40                  45                  50

cga gat gct gat atc gat ccc aac gag cac tct tca gcc gga aaa gat      368
Arg Asp Ala Asp Ile Asp Pro Asn Glu His Ser Ser Ala Gly Lys Asp
            55                  60                  65

caa agt act cct ggc tcc ggt gga gaa agc ggc ggc gga gga gga gga      416
Gln Ser Thr Pro Gly Ser Gly Gly Glu Ser Gly Gly Gly Gly Gly Gly
        70                  75                  80

gat aat cac atc acg aga agg cca cgt ggc aga cca gcg gga tct aag      464
Asp Asn His Ile Thr Arg Arg Pro Arg Gly Arg Pro Ala Gly Ser Lys
    85                  90                  95

aac aaa cca aaa ccg cca atc atc atc act cga gac agc gca aac gct      512
Asn Lys Pro Lys Pro Pro Ile Ile Ile Thr Arg Asp Ser Ala Asn Ala
100                 105                 110                 115

ctc aaa tct cat gtc atg gaa gta gca aac gga tgt gac gtc atg gaa      560
Leu Lys Ser His Val Met Glu Val Ala Asn Gly Cys Asp Val Met Glu
                120                 125                 130

agt gtc acc gtc ttc gct cgc cgt cgc caa cgt ggc atc tgc gtt ttg      608
Ser Val Thr Val Phe Ala Arg Arg Arg Gln Arg Gly Ile Cys Val Leu
            135                 140                 145

agc gga aac ggc gcc gtt acc aac gtt acc ata aga caa cca gct tca      656
Ser Gly Asn Gly Ala Val Thr Asn Val Thr Ile Arg Gln Pro Ala Ser
        150                 155                 160

gta cct ggt ggt ggc tca tct gtc gtt aac tta cac gga cgt ttc gag      704
Val Pro Gly Gly Gly Ser Ser Val Val Asn Leu His Gly Arg Phe Glu
    165                 170                 175

att ctt tct ctc tcg gga tca ttc ctt cct cct ccg gct cca cca gct      752
Ile Leu Ser Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala Pro Pro Ala
180                 185                 190                 195

gcg tca ggt cta acg att tac tta gcc ggt ggt cag gga cag gtt gtt      800
Ala Ser Gly Leu Thr Ile Tyr Leu Ala Gly Gly Gln Gly Gln Val Val
                200                 205                 210

gga gga agc gtg gtt ggt cca ctc atg gct tca gga cct gta gtg att      848
Gly Gly Ser Val Val Gly Pro Leu Met Ala Ser Gly Pro Val Val Ile
            215                 220                 225
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atg gca gct tcg ttt gga aac gct gcg tat gag aga ctg ccg ttg gag      896
Met Ala Ala Ser Phe Gly Asn Ala Ala Tyr Glu Arg Leu Pro Leu Glu
        230                 235                 240

gaa gac gat caa gaa gag caa aca gct gga gcg gtt gct aat aat atc      944
Glu Asp Asp Gln Glu Glu Gln Thr Ala Gly Ala Val Ala Asn Asn Ile
    245                 250                 255

gat gga aac gca aca atg ggt ggt gga acg caa acg caa act cag acg      992
Asp Gly Asn Ala Thr Met Gly Gly Gly Thr Gln Thr Gln Thr Gln Thr
260                 265                 270                 275

cag cag caa cag caa caa cag ttg atg caa gat ccg acg tcg ttt ata     1040
Gln Gln Gln Gln Gln Gln Gln Leu Met Gln Asp Pro Thr Ser Phe Ile
                280                 285                 290

caa ggg ttg cct ccg aat ctt atg aat tct gtt caa ttg cca gct gaa     1088
Gln Gly Leu Pro Pro Asn Leu Met Asn Ser Val Gln Leu Pro Ala Glu
            295                 300                 305

gct tat tgg gga act ccg aga cca tct ttc taa atcgcgaaga aaaaacaagt   1141
Ala Tyr Trp Gly Thr Pro Arg Pro Ser Phe
        310                 315

tagatacgtt cgttgttttt aatttataat ctctcttctg tcaagtttta attttctttt   1201

tcttcttctt tgttttctaa agataattgt agtctttgac gaagattcgt ggtacgtatg   1261

aatcgaagag aatcgttttg gtcatgggat tgctcgatct attaggtttg agaggggttt   1321

tgtgttttgc gttgactagc agattataaa attgttgatt ttcgagtttt tattttcatg   1381

tgttggtgat aaa                                                     1394
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Met Asp Gln Val Ser Arg Ser Leu Pro Pro Pro Phe Leu Ser Arg Asp
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Leu His Leu His Pro His His Gln Phe Gln His Gln Gln Gln Gln Gln
            20                  25                  30

Gln Gln Asn His Gly His Asp Ile Asp Gln His Arg Ile Gly Gly Leu
        35                  40                  45

Lys Arg Asp Arg Asp Ala Asp Ile Asp Pro Asn Glu His Ser Ser Ala
    50                  55                  60

Gly Lys Asp Gln Ser Thr Pro Gly Ser Gly Gly Glu Ser Gly Gly Gly
65                  70                  75                  80
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Gly Gly Gly Asp Asn His Ile Thr Arg Arg Pro Arg Gly Arg Pro Ala
85 90 95

Gly Ser Lys Asn Lys Pro Lys Pro Pro Ile Ile Ile Thr Arg Asp Ser
100 105 110

Ala Asn Ala Leu Lys Ser His Val Met Glu Val Ala Asn Gly Cys Asp
115 120 125

Val Met Glu Ser Val Thr Val Phe Ala Arg Arg Arg Gln Arg Gly Ile
130 135 140

Cys Val Leu Ser Gly Asn Gly Ala Val Thr Asn Val Thr Ile Arg Gln
145 150 155 160

Pro Ala Ser Val Pro Gly Gly Gly Ser Ser Val Val Asn Leu His Gly
165 170 175

Arg Phe Glu Ile Leu Ser Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala
180 185 190

Pro Pro Ala Ala Ser Gly Leu Thr Ile Tyr Leu Ala Gly Gly Gln Gly
195 200 205

Gln Val Val Gly Gly Ser Val Val Gly Pro Leu Met Ala Ser Gly Pro
210 215 220

Val Val Ile Met Ala Ala Ser Phe Gly Asn Ala Ala Tyr Glu Arg Leu
225 230 235 240

Pro Leu Glu Glu Asp Asp Gln Glu Glu Gln Thr Ala Gly Ala Val Ala
245 250 255

Asn Asn Ile Asp Gly Asn Ala Thr Met Gly Gly Gly Thr Gln Thr Gln
260 265 270

Thr Gln Thr Gln Gln Gln Gln Gln Gln Gln Leu Met Gln Asp Pro Thr
275 280 285

Ser Phe Ile Gln Gly Leu Pro Pro Asn Leu Met Asn Ser Val Gln Leu
290 295 300

Pro Ala Glu Ala Tyr Trp Gly Thr Pro Arg Pro Ser Phe

305 310 315

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aatttaactg gcgccagatt gtgatccagg aatcgttggc ttgttaggtt gttgttttgt 120

tatgcataat tgagag atg gtg gtc aaa agg aag tta aat tgt ggt ggc tct 172
Met Val Val Lys Arg Lys Leu Asn Cys Gly Gly Ser
1 5 10

gat ggt ttt gat ttc ccc aat att ccc aag gct cct cgt tca agc agg 220
Asp Gly Phe Asp Phe Pro Asn Ile Pro Lys Ala Pro Arg Ser Ser Arg
15 20 25

agg aag gtc tca ggt aag aga tct gat gat gaa agt gag atc tgt gca 268
Arg Lys Val Ser Gly Lys Arg Ser Asp Asp Glu Ser Glu Ile Cys Ala
30 35 40

att gat ttg cta gct tct ctt gct gga aag ttg ttg gaa gaa agt gaa 316
Ile Asp Leu Leu Ala Ser Leu Ala Gly Lys Leu Leu Glu Glu Ser Glu
45 50 55 60

agt tcc tca acg tct acc tat gca tct gaa gct gat aat ctt gat cat 364
Ser Ser Ser Thr Ser Thr Tyr Ala Ser Glu Ala Asp Asn Leu Asp His
65 70 75

ttg ggt gga ctg att aag caa gaa ctt gaa gat ggc tat act act aag 412
Leu Gly Gly Leu Ile Lys Gln Glu Leu Glu Asp Gly Tyr Thr Thr Lys
80 85 90

cct tgt aaa tcc gag ttt ttc gat cca gga aac cct gct tca aag tcc 460
Pro Cys Lys Ser Glu Phe Phe Asp Pro Gly Asn Pro Ala Ser Lys Ser
95 100 105

act agt gaa aat act agc gtg act tgt ttg cca ttt tcg tct ttc gaa 508
Thr Ser Glu Asn Thr Ser Val Thr Cys Leu Pro Phe Ser Ser Phe Glu
110 115 120

aat gat tgc att ttg gag caa aca ccg gtt tct gat tgt aag agg gca 556
Asn Asp Cys Ile Leu Glu Gln Thr Pro Val Ser Asp Cys Lys Arg Ala
125 130 135 140

tct ggt ttg aag tcc ctg gta ggg agc atc act gag gag aca tgt gtt 604
Ser Gly Leu Lys Ser Leu Val Gly Ser Ile Thr Glu Glu Thr Cys Val
145 150 155

gtt aat gag gat gcc gga tct gaa caa ggt gct aat act ttc agc tta 652
Val Asn Glu Asp Ala Gly Ser Glu Gln Gly Ala Asn Thr Phe Ser Leu
160 165 170

aag gat cca agt caa tta cat tcg cag tct cca gaa tcg gtc ctt ctg 700
Lys Asp Pro Ser Gln Leu His Ser Gln Ser Pro Glu Ser Val Leu Leu

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        175                 180                 185

gat ggc gat gtg aaa tta gca cca tgc acg gat caa gtc cct aat gat      748
Asp Gly Asp Val Lys Leu Ala Pro Cys Thr Asp Gln Val Pro Asn Asp
    190                 195                 200

tct ttt aaa gga tat agg aat cat tct aag tta gtt tgc aga gat gat      796
Ser Phe Lys Gly Tyr Arg Asn His Ser Lys Leu Val Cys Arg Asp Asp
205                 210                 215                 220

gac gaa aac tat tgt aag tat tat aaa ttt agt gac aaa tgt aag tca      844
Asp Glu Asn Tyr Cys Lys Tyr Tyr Lys Phe Ser Asp Lys Cys Lys Ser
                225                 230                 235

tat agg cct ctc tcc cgg gtt ggc aat aga aga ata atg cag tcg gtg      892
Tyr Arg Pro Leu Ser Arg Val Gly Asn Arg Arg Ile Met Gln Ser Val
            240                 245                 250

aga gca atc tcc aag ttg aag tgt ttt gaa gac act aga aca gat ggt      940
Arg Ala Ile Ser Lys Leu Lys Cys Phe Glu Asp Thr Arg Thr Asp Gly
        255                 260                 265

cgt ttg aag gct ctc tac cgc aag aga aaa tta tgt tat ggt tac aac      988
Arg Leu Lys Ala Leu Tyr Arg Lys Arg Lys Leu Cys Tyr Gly Tyr Asn
    270                 275                 280

cca tgg aag cgt gag acc att cat agg aag aga aga ttg tct gac aaa     1036
Pro Trp Lys Arg Glu Thr Ile His Arg Lys Arg Arg Leu Ser Asp Lys
285                 290                 295                 300

ggt ttg gtc gta aat tat gat ggt ggg ctc agt agt gaa agt gtt tcc     1084
Gly Leu Val Val Asn Tyr Asp Gly Gly Leu Ser Ser Glu Ser Val Ser
                305                 310                 315

aat tca cct gaa aag gga gaa tca gaa aat ggt gat ttc tct gct gca     1132
Asn Ser Pro Glu Lys Gly Glu Ser Glu Asn Gly Asp Phe Ser Ala Ala
            320                 325                 330

aaa ata ggt ctt ctt tcg aaa gac tcc cgt gta aag ttc agc atc aag     1180
Lys Ile Gly Leu Leu Ser Lys Asp Ser Arg Val Lys Phe Ser Ile Lys
        335                 340                 345

tcc ctt agg att ccg gag ctt gta att gaa gtt cca gaa aca gca aca     1228
Ser Leu Arg Ile Pro Glu Leu Val Ile Glu Val Pro Glu Thr Ala Thr
    350                 355                 360

gta ggc tta ctg aag agg acg gtg aag gag gcg gtt act gct tta ctc     1276
Val Gly Leu Leu Lys Arg Thr Val Lys Glu Ala Val Thr Ala Leu Leu
365                 370                 375                 380

ggt ggt gga ata cgt att ggg gtg tta gtc caa ggg aaa aaa gtt aga     1324
Gly Gly Gly Ile Arg Ile Gly Val Leu Val Gln Gly Lys Lys Val Arg
                385                 390                 395

gat gac aac aac act cta tca cag act ggt ctt tcg tgt aga gaa aat     1372
Asp Asp Asn Asn Thr Leu Ser Gln Thr Gly Leu Ser Cys Arg Glu Asn
            400                 405                 410
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ctt ggc aac ctt ggc ttc acc tta gag cct ggt ttg gaa aca ctg cct     1420
Leu Gly Asn Leu Gly Phe Thr Leu Glu Pro Gly Leu Glu Thr Leu Pro
        415                 420                 425

gta cct ctt tgt tct gaa act cct gtc ctt tct ctg cca act gac tct     1468
Val Pro Leu Cys Ser Glu Thr Pro Val Leu Ser Leu Pro Thr Asp Ser
    430                 435                 440

aca aag ttg tca gaa agg tcc gca gct tct cca gcg tta gag act gga     1516
Thr Lys Leu Ser Glu Arg Ser Ala Ala Ser Pro Ala Leu Glu Thr Gly
445                 450                 455                 460

att cct ctc cct ccc caa gat gaa gat tac ttg att aat ttg gga aat     1564
Ile Pro Leu Pro Pro Gln Asp Glu Asp Tyr Leu Ile Asn Leu Gly Asn
                465                 470                 475

agt gtg gag aac aat gat gaa tta gtc cca cat ctg agt gac ata cca     1612
Ser Val Glu Asn Asn Asp Glu Leu Val Pro His Leu Ser Asp Ile Pro
            480                 485                 490

gct gat gaa caa cct tca tca gat tca aga gcg ctg gtt cca gtt ttg     1660
Ala Asp Glu Gln Pro Ser Ser Asp Ser Arg Ala Leu Val Pro Val Leu
        495                 500                 505

gcc ttg gag tcc gac gct ctt gca ctt gtt cca gtt aac gag aaa cct     1708
Ala Leu Glu Ser Asp Ala Leu Ala Leu Val Pro Val Asn Glu Lys Pro
    510                 515                 520

aag cgt aca gag ctt tca caa cgc aga acc agg aga cca ttc tct gtt     1756
Lys Arg Thr Glu Leu Ser Gln Arg Arg Thr Arg Arg Pro Phe Ser Val
525                 530                 535                 540

aca gag gta gaa gct cta gta agc gca gtt gaa gaa gtt ggg act gga     1804
Thr Glu Val Glu Ala Leu Val Ser Ala Val Glu Glu Val Gly Thr Gly
                545                 550                 555

aga tgg cgt gat gtg aag ttg cgt tct ttt gag aat gca agt cat cga     1852
Arg Trp Arg Asp Val Lys Leu Arg Ser Phe Glu Asn Ala Ser His Arg
            560                 565                 570

acc tat gtg gac ttg aag gac aaa tgg aaa acg ttg gtt cac aca gca     1900
Thr Tyr Val Asp Leu Lys Asp Lys Trp Lys Thr Leu Val His Thr Ala
        575                 580                 585

agt ata tca cca cag caa cga aga gga gaa cca gtg cct caa gaa ctg     1948
Ser Ile Ser Pro Gln Gln Arg Arg Gly Glu Pro Val Pro Gln Glu Leu
    590                 595                 600

cta gac aga gtc tta gga gca cat agg tac tgg aca cag cac caa atg     1996
Leu Asp Arg Val Leu Gly Ala His Arg Tyr Trp Thr Gln His Gln Met
605                 610                 615                 620

aaa cag aac ggg aaa cat cag gtg gct aca aca atg gtg gtt gaa gca     2044
Lys Gln Asn Gly Lys His Gln Val Ala Thr Thr Met Val Val Glu Ala
                625                 630                 635
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Replacement Sheet

ggt tcg tcc atg taa agaaggagaa tggtaataac aataactttc acttgacgac 2099
Gly Ser Ser Met
640

taaggaacca aagtgggcaa ctgtacaaag ggaaacaaca aaatacagaa acatacttaa 2159

tttctgaaaa gaagagtcta tatttttatt ttttttaaat catagccggt agaaacaaga 2219

cgttccttga cacttttggt tacttttatg gtaggtctgt tcattccaaa tttctaattg 2279

atttgattat gtaatttggt ggtaggacca tg 2311

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Phe Pro Asn Ile Pro Lys Ala Pro Arg Ser Ser Arg Arg Lys Val Ser
20 25 30

Gly Lys Arg Ser Asp Asp Glu Ser Glu Ile Cys Ala Ile Asp Leu Leu
35 40 45

Ala Ser Leu Ala Gly Lys Leu Leu Glu Glu Ser Glu Ser Ser Ser Thr
50 55 60

Ser Thr Tyr Ala Ser Glu Ala Asp Asn Leu Asp His Leu Gly Gly Leu
65 70 75 80

Ile Lys Gln Glu Leu Glu Asp Gly Tyr Thr Thr Lys Pro Cys Lys Ser
85 90 95

Glu Phe Phe Asp Pro Gly Asn Pro Ala Ser Lys Ser Thr Ser Glu Asn
100 105 110

Thr Ser Val Thr Cys Leu Pro Phe Ser Ser Phe Glu Asn Asp Cys Ile
115 120 125

Leu Glu Gln Thr Pro Val Ser Asp Cys Lys Arg Ala Ser Gly Leu Lys
130 135 140

Ser Leu Val Gly Ser Ile Thr Glu Glu Thr Cys Val Val Asn Glu Asp
145 150 155 160

Ala Gly Ser Glu Gln Gly Ala Asn Thr Phe Ser Leu Lys Asp Pro Ser
165 170 175

Gln Leu His Ser Gln Ser Pro Glu Ser Val Leu Leu Asp Gly Asp Val
180 185 190

Lys Leu Ala Pro Cys Thr Asp Gln Val Pro Asn Asp Ser Phe Lys Gly
195 200 205

Tyr Arg Asn His Ser Lys Leu Val Cys Arg Asp Asp Asp Glu Asn Tyr
210 215 220

Cys Lys Tyr Tyr Lys Phe Ser Asp Lys Cys Lys Ser Tyr Arg Pro Leu
225 230 235 240

Ser Arg Val Gly Asn Arg Arg Ile Met Gln Ser Val Arg Ala Ile Ser
245 250 255

Lys Leu Lys Cys Phe Glu Asp Thr Arg Thr Asp Gly Arg Leu Lys Ala
260 265 270

Leu Tyr Arg Lys Arg Lys Leu Cys Tyr Gly Tyr Asn Pro Trp Lys Arg
275 280 285

Glu Thr Ile His Arg Lys Arg Arg Leu Ser Asp Lys Gly Leu Val Val
290 295 300

Asn Tyr Asp Gly Gly Leu Ser Ser Glu Ser Val Ser Asn Ser Pro Glu
305 310 315 320

Lys Gly Glu Ser Glu Asn Gly Asp Phe Ser Ala Ala Lys Ile Gly Leu
325 330 335

Leu Ser Lys Asp Ser Arg Val Lys Phe Ser Ile Lys Ser Leu Arg Ile
340 345 350

Pro Glu Leu Val Ile Glu Val Pro Glu Thr Ala Thr Val Gly Leu Leu
355 360 365

Lys Arg Thr Val Lys Glu Ala Val Thr Ala Leu Leu Gly Gly Gly Ile
370 375 380

Arg Ile Gly Val Leu Val Gln Gly Lys Lys Val Arg Asp Asp Asn Asn
385 390 395 400

Thr Leu Ser Gln Thr Gly Leu Ser Cys Arg Glu Asn Leu Gly Asn Leu
405 410 415

Gly Phe Thr Leu Glu Pro Gly Leu Glu Thr Leu Pro Val Pro Leu Cys
420 425 430

Ser Glu Thr Pro Val Leu Ser Leu Pro Thr Asp Ser Thr Lys Leu Ser
435 440 445

Glu Arg Ser Ala Ala Ser Pro Ala Leu Glu Thr Gly Ile Pro Leu Pro
450 455 460

Pro Gln Asp Glu Asp Tyr Leu Ile Asn Leu Gly Asn Ser Val Glu Asn
465 470 475 480

Asn Asp Glu Leu Val Pro His Leu Ser Asp Ile Pro Ala Asp Glu Gln
485 490 495

Pro Ser Ser Asp Ser Arg Ala Leu Val Pro Val Leu Ala Leu Glu Ser
500 505 510

Asp Ala Leu Ala Leu Val Pro Val Asn Glu Lys Pro Lys Arg Thr Glu
515 520 525

Leu Ser Gln Arg Arg Thr Arg Arg Pro Phe Ser Val Thr Glu Val Glu
530 535 540

Ala Leu Val Ser Ala Val Glu Glu Val Gly Thr Gly Arg Trp Arg Asp
545 550 555 560

Val Lys Leu Arg Ser Phe Glu Asn Ala Ser His Arg Thr Tyr Val Asp
565 570 575

Leu Lys Asp Lys Trp Lys Thr Leu Val His Thr Ala Ser Ile Ser Pro
580 585 590

Gln Gln Arg Arg Gly Glu Pro Val Pro Gln Glu Leu Leu Asp Arg Val
595 600 605

Leu Gly Ala His Arg Tyr Trp Thr Gln His Gln Met Lys Gln Asn Gly
610 615 620

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Lys His Gln Val Ala Thr Thr Met Val Val Glu Ala Gly Ser Ser Met
625                 630                 635                 640
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<222> (59)..(1141) <223> G617

<400> 385

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atg aga tca gga gaa tgt gat gaa gag gag att caa gca aag caa gaa       106
Met Arg Ser Gly Glu Cys Asp Glu Glu Glu Ile Gln Ala Lys Gln Glu
1               5                  10                  15

aga gat caa aat caa aat cat caa gta aac tta aac cac atg ttg caa       154
Arg Asp Gln Asn Gln Asn His Gln Val Asn Leu Asn His Met Leu Gln
            20                  25                  30

caa caa cag ccg agt tcg gta tca tct tca agg caa tgg act tca gct       202
Gln Gln Gln Pro Ser Ser Val Ser Ser Ser Arg Gln Trp Thr Ser Ala
        35                  40                  45

ttt agg aat cca aga atc gtt cga gtc tca aga aca ttc ggt ggc aaa       250
Phe Arg Asn Pro Arg Ile Val Arg Val Ser Arg Thr Phe Gly Gly Lys
    50                  55                  60

gac aga cac agc aaa gta tgt aca gtc cgt ggt ctt cga gac cgg agg       298
Asp Arg His Ser Lys Val Cys Thr Val Arg Gly Leu Arg Asp Arg Arg
65                  70                  75                  80

ata agg ttg tcc gta cct aca gct att caa ctc tac gac ctt caa gat       346
Ile Arg Leu Ser Val Pro Thr Ala Ile Gln Leu Tyr Asp Leu Gln Asp
                85                  90                  95

cga tta ggg ctg agt cag cca agc aaa gtc att gat tgg tta ctc gaa       394
Arg Leu Gly Leu Ser Gln Pro Ser Lys Val Ile Asp Trp Leu Leu Glu
            100                 105                 110

gca gca aaa gat gac gta gac aag cta cct cct cta caa ttc cca cat       442
Ala Ala Lys Asp Asp Val Asp Lys Leu Pro Pro Leu Gln Phe Pro His
        115                 120                 125

gga ttt aac cag atg tat cca aat ctc atc ttc gga aac tcc ggg ttt       490
Gly Phe Asn Gln Met Tyr Pro Asn Leu Ile Phe Gly Asn Ser Gly Phe
    130                 135                 140

gga gaa tct cca tct tca act aca tca aca acg ttt cca gga acc aat       538
Gly Glu Ser Pro Ser Ser Thr Thr Ser Thr Thr Phe Pro Gly Thr Asn
145                 150                 155                 160

ctc ggg ttc ttg gaa aat tgg gat ctt ggt ggt tct tca aga aca aga       586
Leu Gly Phe Leu Glu Asn Trp Asp Leu Gly Gly Ser Ser Arg Thr Arg
                165                 170                 175

gca aga tta acc gat aca act acg acc caa aga gaa agt ttt gat ctt       634
Ala Arg Leu Thr Asp Thr Thr Thr Thr Gln Arg Glu Ser Phe Asp Leu
            180                 185                 190
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gat aaa gga aaa tgg atc aaa aac gac gag aat agt aat caa gat cat      682
Asp Lys Gly Lys Trp Ile Lys Asn Asp Glu Asn Ser Asn Gln Asp His
        195                 200                 205

caa ggg ttt aac acc aat cat caa caa caa ttt cct ctg acc aat ccg      730
Gln Gly Phe Asn Thr Asn His Gln Gln Gln Phe Pro Leu Thr Asn Pro
    210                 215                 220

tac aac aac act tca gct tat tac aac ctt gga cat ctt caa caa tcg      778
Tyr Asn Asn Thr Ser Ala Tyr Tyr Asn Leu Gly His Leu Gln Gln Ser
225                 230                 235                 240

tta gac caa tct ggt aat aac gtt act gtc gca ata tct aat gtt gct      826
Leu Asp Gln Ser Gly Asn Asn Val Thr Val Ala Ile Ser Asn Val Ala
                245                 250                 255

gct aat aat aac aat aat ctc aat ttg cat cct cct tcc tcg tct gcc      874
Ala Asn Asn Asn Asn Asn Leu Asn Leu His Pro Pro Ser Ser Ser Ala
            260                 265                 270

gga gat gga tct cag ctt ttt ttc ggt cct act cct ccg gca atg agc      922
Gly Asp Gly Ser Gln Leu Phe Phe Gly Pro Thr Pro Pro Ala Met Ser
        275                 280                 285

tct cta ttc ccg aca tac cct tcg ttt ctt gga gct tct cat cat cat      970
Ser Leu Phe Pro Thr Tyr Pro Ser Phe Leu Gly Ala Ser His His His
    290                 295                 300

cat gtc gtc gat gga gcc ggt cat ctt cag ctc ttt agc tcg aat tca     1018
His Val Val Asp Gly Ala Gly His Leu Gln Leu Phe Ser Ser Asn Ser
305                 310                 315                 320

aat acc gca tcg cag caa cac atg atg ccg ggt aat acg agt ttg att     1066
Asn Thr Ala Ser Gln Gln His Met Met Pro Gly Asn Thr Ser Leu Ile
                325                 330                 335

aga cca ttt cat cat ttg atg agc tcg aat cat gat acg gat cat cat     1114
Arg Pro Phe His His Leu Met Ser Ser Asn His Asp Thr Asp His His
            340                 345                 350

agt agc gat aat gaa tca gat tct tga atgattttat atatctacac           1161
Ser Ser Asp Asn Glu Ser Asp Ser
        355                 360

tatacattga aaatgttata tgtatacgta ttcttctata ttttgatata tatgcgtatt   1221

gttggattgg tttatgtatc t                                            1242


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Met Arg Ser Gly Glu Cys Asp Glu Glu Glu Ile Gln Ala Lys Gln Glu
1               5                   10                  15


Arg Asp Gln Asn Gln Asn His Gln Val Asn Leu Asn His Met Leu Gln
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                20                  25                  30

Gln Gln Gln Pro Ser Ser Val Ser Ser Ser Arg Gln Trp Thr Ser Ala
        35                  40                  45

Phe Arg Asn Pro Arg Ile Val Arg Val Ser Arg Thr Phe Gly Gly Lys
    50                  55                  60

Asp Arg His Ser Lys Val Cys Thr Val Arg Gly Leu Arg Asp Arg Arg
65                  70                  75                  80

Ile Arg Leu Ser Val Pro Thr Ala Ile Gln Leu Tyr Asp Leu Gln Asp
                85                  90                  95

Arg Leu Gly Leu Ser Gln Pro Ser Lys Val Ile Asp Trp Leu Leu Glu
            100                 105                 110

Ala Ala Lys Asp Asp Val Asp Lys Leu Pro Pro Leu Gln Phe Pro His
        115                 120                 125

Gly Phe Asn Gln Met Tyr Pro Asn Leu Ile Phe Gly Asn Ser Gly Phe
    130                 135                 140

Gly Glu Ser Pro Ser Ser Thr Thr Ser Thr Thr Phe Pro Gly Thr Asn
145                 150                 155                 160

Leu Gly Phe Leu Glu Asn Trp Asp Leu Gly Gly Ser Ser Arg Thr Arg
                165                 170                 175

Ala Arg Leu Thr Asp Thr Thr Thr Thr Gln Arg Glu Ser Phe Asp Leu
            180                 185                 190

Asp Lys Gly Lys Trp Ile Lys Asn Asp Glu Asn Ser Asn Gln Asp His
        195                 200                 205

Gln Gly Phe Asn Thr Asn His Gln Gln Gln Phe Pro Leu Thr Asn Pro
    210                 215                 220

Tyr Asn Asn Thr Ser Ala Tyr Tyr Asn Leu Gly His Leu Gln Gln Ser
225                 230                 235                 240

Leu Asp Gln Ser Gly Asn Asn Val Thr Val Ala Ile Ser Asn Val Ala
                245                 250                 255
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Ala Asn Asn Asn Asn Asn Leu Asn Leu His Pro Pro Ser Ser Ser Ala
260 265 270

Gly Asp Gly Ser Gln Leu Phe Phe Gly Pro Thr Pro Pro Ala Met Ser
275 280 285

Ser Leu Phe Pro Thr Tyr Pro Ser Phe Leu Gly Ala Ser His His His
290 295 300

His Val Val Asp Gly Ala Gly His Leu Gln Leu Phe Ser Ser Asn Ser
305 310 315 320

Asn Thr Ala Ser Gln Gln His Met Met Pro Gly Asn Thr Ser Leu Ile
325 330 335

Arg Pro Phe His His Leu Met Ser Ser Asn His Asp Thr Asp His His
340 345 350

Ser Ser Asp Asn Glu Ser Asp Ser
355 360

<210> 387 <211> 2157 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(2157) <223> G644

<400> 387
atg att act gaa cca agt cta acc ggg att tca ggt atg gtt aat cgg 48
Met Ile Thr Glu Pro Ser Leu Thr Gly Ile Ser Gly Met Val Asn Arg
1 5 10 15

aac cgt tta tcc ggt tta ccc gat caa cct tct tcg cat agc ttc act 96
Asn Arg Leu Ser Gly Leu Pro Asp Gln Pro Ser Ser His Ser Phe Thr
20 25 30

ccg gta aca cta tac gac ggt ttc aat tac aat ctc tcc tcc gat cat 144
Pro Val Thr Leu Tyr Asp Gly Phe Asn Tyr Asn Leu Ser Ser Asp His
35 40 45

ata aac acc gtt gta gca gcg ccg gag aat tca gtt ttt atc cgg gaa 192
Ile Asn Thr Val Val Ala Ala Pro Glu Asn Ser Val Phe Ile Arg Glu
50 55 60

gaa gaa gaa gaa gag gat cca gct gat gat ttc gat ttc tct gac gct 240
Glu Glu Glu Glu Glu Asp Pro Ala Asp Asp Phe Asp Phe Ser Asp Ala
65 70 75 80

gtt tta gga tac att agt cag atg ttg aat gag gaa gac atg gat gat 288
Val Leu Gly Tyr Ile Ser Gln Met Leu Asn Glu Glu Asp Met Asp Asp
85 90 95

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aaa gtc tgc atg ctt caa gag tct cta gat ctc gaa gct gct gag aga      336
Lys Val Cys Met Leu Gln Glu Ser Leu Asp Leu Glu Ala Ala Glu Arg
            100                 105                 110

tcg tta tac gaa gct att ggt aag aag tat cct cca tct cca gaa cga      384
Ser Leu Tyr Glu Ala Ile Gly Lys Lys Tyr Pro Pro Ser Pro Glu Arg
        115                 120                 125

aac tta gct ttc gct gaa cga aac agc gag aat ctt gac cgt gtg gtt      432
Asn Leu Ala Phe Ala Glu Arg Asn Ser Glu Asn Leu Asp Arg Val Val
    130                 135                 140

cca gga aac tac act gga gga gat tgt ata ggt ttt ggg aac ggt gga      480
Pro Gly Asn Tyr Thr Gly Gly Asp Cys Ile Gly Phe Gly Asn Gly Gly
145                 150                 155                 160

atc aag cct ttg agt agt ggt ttt act ttg gat ttt cga aat cct cag      528
Ile Lys Pro Leu Ser Ser Gly Phe Thr Leu Asp Phe Arg Asn Pro Gln
                165                 170                 175

agt tgt tct tcg att cta agt gtt cca caa tct aat ggt tta att act      576
Ser Cys Ser Ser Ile Leu Ser Val Pro Gln Ser Asn Gly Leu Ile Thr
            180                 185                 190

atc tac gga gat gga att gat gaa tcg tcg aag aac aat cgg gag aat      624
Ile Tyr Gly Asp Gly Ile Asp Glu Ser Ser Lys Asn Asn Arg Glu Asn
        195                 200                 205

cat caa tct gtt tgg ttg ttt agg cgt gag att gaa gaa gct aat agg      672
His Gln Ser Val Trp Leu Phe Arg Arg Glu Ile Glu Glu Ala Asn Arg
    210                 215                 220

ttt aat cct gaa gaa aac gag ttg att gtg aat ttc aga gag gag aat      720
Phe Asn Pro Glu Glu Asn Glu Leu Ile Val Asn Phe Arg Glu Glu Asn
225                 230                 235                 240

tgt gtg agc aaa gca agg aag aac tct agc cgt gat gag att tgt gtt      768
Cys Val Ser Lys Ala Arg Lys Asn Ser Ser Arg Asp Glu Ile Cys Val
                245                 250                 255

gaa gaa gag agg agt agt aaa tta cct gca gtg ttt ggt gag gat att      816
Glu Glu Glu Arg Ser Ser Lys Leu Pro Ala Val Phe Gly Glu Asp Ile
            260                 265                 270

ttg agg tca gat gtt gta gat aag atc ttg gtt cat gta cca gga gga      864
Leu Arg Ser Asp Val Val Asp Lys Ile Leu Val His Val Pro Gly Gly
        275                 280                 285

gag agc atg aag gag ttt aat gcg ttg cgt gac gtt ttg aag aaa gga      912
Glu Ser Met Lys Glu Phe Asn Ala Leu Arg Asp Val Leu Lys Lys Gly
    290                 295                 300

gtg gag aag aag aaa gct tca gat gct caa ggt ggg aag aga cga gcc      960
Val Glu Lys Lys Lys Ala Ser Asp Ala Gln Gly Gly Lys Arg Arg Ala
305                 310                 315                 320
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aga gga aga gga cgt gga aga gga aga gga gga gga gga ggg caa aat      1008
Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Gly Gly Gly Gln Asn
                325                 330                 335

ggg aaa aaa gaa gtt gtg gat ttg aga agt tta ttg ata cat tgt gct      1056
Gly Lys Lys Glu Val Val Asp Leu Arg Ser Leu Leu Ile His Cys Ala
            340                 345                 350

caa gct gtt gca gct gat gat cgt agg tgt gca ggt cag ttg tta aaa      1104
Gln Ala Val Ala Ala Asp Asp Arg Arg Cys Ala Gly Gln Leu Leu Lys
        355                 360                 365

cag ata aga ttg cat tct acg ccg ttt ggt gat ggg aat cag agg ttg      1152
Gln Ile Arg Leu His Ser Thr Pro Phe Gly Asp Gly Asn Gln Arg Leu
    370                 375                 380

gct cat tgt ttt gct aat ggt ctc gag gcg agg tta gcc ggt act gga      1200
Ala His Cys Phe Ala Asn Gly Leu Glu Ala Arg Leu Ala Gly Thr Gly
385                 390                 395                 400

agc cag att tac aaa ggg att gtg agt aaa ccg aga tcc gct gca gct      1248
Ser Gln Ile Tyr Lys Gly Ile Val Ser Lys Pro Arg Ser Ala Ala Ala
                405                 410                 415

gtg ttg aag gct cac cag ctt ttt ctt gcg tgt tgt cct ttt aga aag      1296
Val Leu Lys Ala His Gln Leu Phe Leu Ala Cys Cys Pro Phe Arg Lys
            420                 425                 430

ctc tct tat ttc ata act aat aag acg ata cgt gat ctt gtt ggg aac      1344
Leu Ser Tyr Phe Ile Thr Asn Lys Thr Ile Arg Asp Leu Val Gly Asn
        435                 440                 445

tct cag cgc gtt cat gtt att gat ttt ggt att ctt tac ggt ttc caa      1392
Ser Gln Arg Val His Val Ile Asp Phe Gly Ile Leu Tyr Gly Phe Gln
    450                 455                 460

tgg cca act ctt att cac cgg ttt tcg atg tat gga tca ccg aag gtt      1440
Trp Pro Thr Leu Ile His Arg Phe Ser Met Tyr Gly Ser Pro Lys Val
465                 470                 475                 480

agg atc acc ggg att gag ttt ccg cag ccc ggg ttt cgt ccg gca cag      1488
Arg Ile Thr Gly Ile Glu Phe Pro Gln Pro Gly Phe Arg Pro Ala Gln
                485                 490                 495

cgg gtt gaa gaa act ggt caa agg tta gca gcg tat gcc aaa ctc ttt      1536
Arg Val Glu Glu Thr Gly Gln Arg Leu Ala Ala Tyr Ala Lys Leu Phe
            500                 505                 510

ggg gtg cca ttt gag tat aaa gca att gct aag aag tgg gat gca att      1584
Gly Val Pro Phe Glu Tyr Lys Ala Ile Ala Lys Lys Trp Asp Ala Ile
        515                 520                 525

caa ctt gaa gat ctt gat atc gac agg gat gag att act gtt gtt aat      1632
Gln Leu Glu Asp Leu Asp Ile Asp Arg Asp Glu Ile Thr Val Val Asn
    530                 535                 540

tgc ctg tac cgg gct gag aat ttg cat gat gag tca gtc aaa gta gaa      1680
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Cys Leu Tyr Arg Ala Glu Asn Leu His Asp Glu Ser Val Lys Val Glu
545                 550                 555                 560

agt tgt aga gac act gtt ctc aat ttg atc ggg aag atc aat cct gat     1728
Ser Cys Arg Asp Thr Val Leu Asn Leu Ile Gly Lys Ile Asn Pro Asp
                565                 570                 575

ctc ttt gtc ttt ggc att gtg aat ggt gca tac aac gca ccg ttt ttc     1776
Leu Phe Val Phe Gly Ile Val Asn Gly Ala Tyr Asn Ala Pro Phe Phe
            580                 585                 590

gta aca cgg ttt cgc gaa gct cta ttt cat ttc tcc tcg att ttt gac     1824
Val Thr Arg Phe Arg Glu Ala Leu Phe His Phe Ser Ser Ile Phe Asp
        595                 600                 605

atg ctt gag aca att gtg cca cga gaa gac gaa gag agg atg ttc ctt     1872
Met Leu Glu Thr Ile Val Pro Arg Glu Asp Glu Glu Arg Met Phe Leu
    610                 615                 620

gag atg gag gtc ttt ggg aga gag gca ctg aat gtg att gct tgc gaa     1920
Glu Met Glu Val Phe Gly Arg Glu Ala Leu Asn Val Ile Ala Cys Glu
625                 630                 635                 640

ggt tgg gaa aga gtg gag agg cct gag aca tac aag cag tgg cac gta     1968
Gly Trp Glu Arg Val Glu Arg Pro Glu Thr Tyr Lys Gln Trp His Val
                645                 650                 655

cgg gct atg agg tca ggg ttg gtg cag gtt cca ttt gac cca agc att     2016
Arg Ala Met Arg Ser Gly Leu Val Gln Val Pro Phe Asp Pro Ser Ile
            660                 665                 670

atg aag aca tcg ctg cat aag gtc cac aca ttc tac cac aag gat ttt     2064
Met Lys Thr Ser Leu His Lys Val His Thr Phe Tyr His Lys Asp Phe
        675                 680                 685

gtg atc gat caa gat aac cgg tgg ctc ttg caa ggc tgg aag gga aga     2112
Val Ile Asp Gln Asp Asn Arg Trp Leu Leu Gln Gly Trp Lys Gly Arg
    690                 695                 700

act gtc atg gct ctt tct gtt tgg aaa cca gag tcc aag gct tga         2157
Thr Val Met Ala Leu Ser Val Trp Lys Pro Glu Ser Lys Ala
705                 710                 715
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Met Ile Thr Glu Pro Ser Leu Thr Gly Ile Ser Gly Met Val Asn Arg
1               5                   10                  15

Asn Arg Leu Ser Gly Leu Pro Asp Gln Pro Ser Ser His Ser Phe Thr
            20                  25                  30

Pro Val Thr Leu Tyr Asp Gly Phe Asn Tyr Asn Leu Ser Ser Asp His
        35                  40                  45
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Ile Asn Thr Val Val Ala Ala Pro Glu Asn Ser Val Phe Ile Arg Glu
50 55 60

Glu Glu Glu Glu Glu Asp Pro Ala Asp Asp Phe Asp Phe Ser Asp Ala
65 70 75 80

Val Leu Gly Tyr Ile Ser Gln Met Leu Asn Glu Glu Asp Met Asp Asp
85 90 95

Lys Val Cys Met Leu Gln Glu Ser Leu Asp Leu Glu Ala Ala Glu Arg
100 105 110

Ser Leu Tyr Glu Ala Ile Gly Lys Lys Tyr Pro Pro Ser Pro Glu Arg
115 120 125

Asn Leu Ala Phe Ala Glu Arg Asn Ser Glu Asn Leu Asp Arg Val Val
130 135 140

Pro Gly Asn Tyr Thr Gly Gly Asp Cys Ile Gly Phe Gly Asn Gly Gly
145 150 155 160

Ile Lys Pro Leu Ser Ser Gly Phe Thr Leu Asp Phe Arg Asn Pro Gln
165 170 175

Ser Cys Ser Ser Ile Leu Ser Val Pro Gln Ser Asn Gly Leu Ile Thr
180 185 190

Ile Tyr Gly Asp Gly Ile Asp Glu Ser Ser Lys Asn Asn Arg Glu Asn
195 200 205

His Gln Ser Val Trp Leu Phe Arg Arg Glu Ile Glu Glu Ala Asn Arg
210 215 220

Phe Asn Pro Glu Glu Asn Glu Leu Ile Val Asn Phe Arg Glu Glu Asn
225 230 235 240

Cys Val Ser Lys Ala Arg Lys Asn Ser Ser Arg Asp Glu Ile Cys Val
245 250 255

Glu Glu Glu Arg Ser Ser Lys Leu Pro Ala Val Phe Gly Glu Asp Ile
260 265 270

Leu Arg Ser Asp Val Val Asp Lys Ile Leu Val His Val Pro Gly Gly
275 280 285

Glu Ser Met Lys Glu Phe Asn Ala Leu Arg Asp Val Leu Lys Lys Gly
290 295 300

Val Glu Lys Lys Lys Ala Ser Asp Ala Gln Gly Gly Lys Arg Arg Ala
305 310 315 320

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Gly Gly Gly Gln Asn
325 330 335

Gly Lys Lys Glu Val Val Asp Leu Arg Ser Leu Leu Ile His Cys Ala
340 345 350

Gln Ala Val Ala Ala Asp Asp Arg Arg Cys Ala Gly Gln Leu Leu Lys
355 360 365

Gln Ile Arg Leu His Ser Thr Pro Phe Gly Asp Gly Asn Gln Arg Leu
370 375 380

Ala His Cys Phe Ala Asn Gly Leu Glu Ala Arg Leu Ala Gly Thr Gly
385 390 395 400

Ser Gln Ile Tyr Lys Gly Ile Val Ser Lys Pro Arg Ser Ala Ala Ala
405 410 415

Val Leu Lys Ala His Gln Leu Phe Leu Ala Cys Cys Pro Phe Arg Lys
420 425 430

Leu Ser Tyr Phe Ile Thr Asn Lys Thr Ile Arg Asp Leu Val Gly Asn
435 440 445

Ser Gln Arg Val His Val Ile Asp Phe Gly Ile Leu Tyr Gly Phe Gln
450 455 460

Trp Pro Thr Leu Ile His Arg Phe Ser Met Tyr Gly Ser Pro Lys Val
465 470 475 480

Arg Ile Thr Gly Ile Glu Phe Pro Gln Pro Gly Phe Arg Pro Ala Gln
485 490 495

Arg Val Glu Glu Thr Gly Gln Arg Leu Ala Ala Tyr Ala Lys Leu Phe

500 505 510

Gly Val Pro Phe Glu Tyr Lys Ala Ile Ala Lys Lys Trp Asp Ala Ile
515 520 525

Gln Leu Glu Asp Leu Asp Ile Asp Arg Asp Glu Ile Thr Val Val Asn
530 535 540

Cys Leu Tyr Arg Ala Glu Asn Leu His Asp Glu Ser Val Lys Val Glu
545 550 555 560

Ser Cys Arg Asp Thr Val Leu Asn Leu Ile Gly Lys Ile Asn Pro Asp
565 570 575

Leu Phe Val Phe Gly Ile Val Asn Gly Ala Tyr Asn Ala Pro Phe Phe
580 585 590

Val Thr Arg Phe Arg Glu Ala Leu Phe His Phe Ser Ser Ile Phe Asp
595 600 605

Met Leu Glu Thr Ile Val Pro Arg Glu Asp Glu Glu Arg Met Phe Leu
610 615 620

Glu Met Glu Val Phe Gly Arg Glu Ala Leu Asn Val Ile Ala Cys Glu
625 630 635 640

Gly Trp Glu Arg Val Glu Arg Pro Glu Thr Tyr Lys Gln Trp His Val
645 650 655

Arg Ala Met Arg Ser Gly Leu Val Gln Val Pro Phe Asp Pro Ser Ile
660 665 670

Met Lys Thr Ser Leu His Lys Val His Thr Phe Tyr His Lys Asp Phe
675 680 685

Val Ile Asp Gln Asp Asn Arg Trp Leu Leu Gln Gly Trp Lys Gly Arg
690 695 700

Thr Val Met Ala Leu Ser Val Trp Lys Pro Glu Ser Lys Ala
705 710 715

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<222> (1)..(612) <223> G676

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atg aga aag aaa gta agt agt agt ggt gac gaa gga aac aat gag tac        48
Met Arg Lys Lys Val Ser Ser Ser Gly Asp Glu Gly Asn Asn Glu Tyr
1               5                   10                  15

aag aaa ggt ttg tgg aca gta gaa gaa gac aaa atc ctc atg gat tat        96
Lys Lys Gly Leu Trp Thr Val Glu Glu Asp Lys Ile Leu Met Asp Tyr
            20                  25                  30

gtc aaa gct cat ggc aaa ggt cac tgg aat cgt att gcc aaa aag act       144
Val Lys Ala His Gly Lys Gly His Trp Asn Arg Ile Ala Lys Lys Thr
        35                  40                  45

ggt tta aag aga tgt gga aag agt tgt aga ttg agg tgg atg aat tat       192
Gly Leu Lys Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp Met Asn Tyr
    50                  55                  60

ctc agc cct aat gtg aaa aga ggc aat ttc acc gag caa gaa gag gat       240
Leu Ser Pro Asn Val Lys Arg Gly Asn Phe Thr Glu Gln Glu Glu Asp
65                  70                  75                  80

ctt atc att agg ctc cac aag ttg ctt ggt aat agg tgg tct tta att       288
Leu Ile Ile Arg Leu His Lys Leu Leu Gly Asn Arg Trp Ser Leu Ile
                85                  90                  95

gct aaa aga gtg ccg ggt cga acg gat aat caa gtg aag aac tat tgg       336
Ala Lys Arg Val Pro Gly Arg Thr Asp Asn Gln Val Lys Asn Tyr Trp
            100                 105                 110

aac acg cat ctt agt aag aaa ctc gga atc aaa gat cag aaa acc aaa       384
Asn Thr His Leu Ser Lys Lys Leu Gly Ile Lys Asp Gln Lys Thr Lys
        115                 120                 125

cag agc aat ggt gat att gtt tat caa atc aat ctc ccg aat cct acc       432
Gln Ser Asn Gly Asp Ile Val Tyr Gln Ile Asn Leu Pro Asn Pro Thr
    130                 135                 140

gaa aca tca gaa gaa acg aaa atc tcg aat att gtc gat aac aat aat       480
Glu Thr Ser Glu Glu Thr Lys Ile Ser Asn Ile Val Asp Asn Asn Asn
145                 150                 155                 160

atc ctc gga gat gaa att caa gaa gat cat caa gga agt aac tac ttg       528
Ile Leu Gly Asp Glu Ile Gln Glu Asp His Gln Gly Ser Asn Tyr Leu
                165                 170                 175

agt tca ctt tgg gtt cat gag gat gag ttt gag ctt agc aca ctc acc       576
Ser Ser Leu Trp Val His Glu Asp Glu Phe Glu Leu Ser Thr Leu Thr
            180                 185                 190

aac atg atg gac ttt ata gat gga cac tgt ttt tga                      612
Asn Met Met Asp Phe Ile Asp Gly His Cys Phe
        195                 200
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<210> 390 <211> 203 <212> PRT <213> Arabidopsis thaliana <400> 390

Met Arg Lys Lys Val Ser Ser Ser Gly Asp Glu Gly Asn Asn Glu Tyr
1 5 10 15

Lys Lys Gly Leu Trp Thr Val Glu Glu Asp Lys Ile Leu Met Asp Tyr
20 25 30

Val Lys Ala His Gly Lys Gly His Trp Asn Arg Ile Ala Lys Lys Thr
35 40 45

Gly Leu Lys Arg Cys Gly Lys Ser Cys Arg Leu Arg Trp Met Asn Tyr
50 55 60

Leu Ser Pro Asn Val Lys Arg Gly Asn Phe Thr Glu Gln Glu Glu Asp
65 70 75 80

Leu Ile Ile Arg Leu His Lys Leu Leu Gly Asn Arg Trp Ser Leu Ile
85 90 95

Ala Lys Arg Val Pro Gly Arg Thr Asp Asn Gln Val Lys Asn Tyr Trp
100 105 110

Asn Thr His Leu Ser Lys Lys Leu Gly Ile Lys Asp Gln Lys Thr Lys
115 120 125

Gln Ser Asn Gly Asp Ile Val Tyr Gln Ile Asn Leu Pro Asn Pro Thr
130 135 140

Glu Thr Ser Glu Glu Thr Lys Ile Ser Asn Ile Val Asp Asn Asn Asn
145 150 155 160

Ile Leu Gly Asp Glu Ile Gln Glu Asp His Gln Gly Ser Asn Tyr Leu
165 170 175

Ser Ser Leu Trp Val His Glu Asp Glu Phe Glu Leu Ser Thr Leu Thr
180 185 190

Asn Met Met Asp Phe Ile Asp Gly His Cys Phe
195 200

<210> 391 <211> 705 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(705) <223> G715

<400> 391
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Met Asp Thr Asn Asn Gln Gln Pro Pro Pro Ser Ala Ala Gly Ile Pro
1               5                  10                  15

cct cca cca cct gga acc acc atc tcc gcc gca gga gga gga gct tct      96
Pro Pro Pro Pro Gly Thr Thr Ile Ser Ala Ala Gly Gly Gly Ala Ser
            20                  25                  30

tac cac cac ctt ctc caa caa caa caa caa cag ctc caa cta ttc tgg     144
Tyr His His Leu Leu Gln Gln Gln Gln Gln Gln Leu Gln Leu Phe Trp
        35                  40                  45

acc tac caa cgc caa gag atc gaa caa gtt aac gat ttc aaa aac cat     192
Thr Tyr Gln Arg Gln Glu Ile Glu Gln Val Asn Asp Phe Lys Asn His
    50                  55                  60

cag ctt cca cta gct agg ata aaa aag atc atg aaa gcc gat gaa gat     240
Gln Leu Pro Leu Ala Arg Ile Lys Lys Ile Met Lys Ala Asp Glu Asp
65                  70                  75                  80

gtt cgt atg atc tcc gca gaa gca ccg att ctc ttc gcg aaa gct tgt     288
Val Arg Met Ile Ser Ala Glu Ala Pro Ile Leu Phe Ala Lys Ala Cys
                85                  90                  95

gag ctt ttc att ctc gag ctc acg atc aga tct tgg ctt cac gct gag     336
Glu Leu Phe Ile Leu Glu Leu Thr Ile Arg Ser Trp Leu His Ala Glu
            100                 105                 110

gag aat aaa cgt cgt acg ctt cag aaa aac gat atc gct gct gcg att     384
Glu Asn Lys Arg Arg Thr Leu Gln Lys Asn Asp Ile Ala Ala Ala Ile
        115                 120                 125

act agg act gat atc ttc gat ttc ctt gtt gat att gtt cct aga gat     432
Thr Arg Thr Asp Ile Phe Asp Phe Leu Val Asp Ile Val Pro Arg Asp
    130                 135                 140

gag att aag gac gaa gcc gca gtc ctc ggt ggt gga atg gtg gtg gct     480
Glu Ile Lys Asp Glu Ala Ala Val Leu Gly Gly Gly Met Val Val Ala
145                 150                 155                 160

cct acc gcg agc ggc gtg cct tac tat tat ccg ccg atg gga caa cca     528
Pro Thr Ala Ser Gly Val Pro Tyr Tyr Tyr Pro Pro Met Gly Gln Pro
                165                 170                 175

gct ggt cct gga ggg atg atg att ggg aga cca gct atg gat ccg aat     576
Ala Gly Pro Gly Gly Met Met Ile Gly Arg Pro Ala Met Asp Pro Asn
            180                 185                 190

ggt gtt tat gtc cag cct ccg tct cag gcg tgg cag agt gtt tgg cag     624
Gly Val Tyr Val Gln Pro Pro Ser Gln Ala Trp Gln Ser Val Trp Gln
        195                 200                 205

act tcg acg ggg acg gga gat gat gtc tct tat ggt agt ggt gga agt     672
Thr Ser Thr Gly Thr Gly Asp Asp Val Ser Tyr Gly Ser Gly Gly Ser
    210                 215                 220

tcc ggt caa ggg aat ctc gac ggc caa ggg taa                         705
Ser Gly Gln Gly Asn Leu Asp Gly Gln Gly
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225 230

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Met Asp Thr Asn Asn Gln Gln Pro Pro Pro Ser Ala Ala Gly Ile Pro
1 5 10 15

Pro Pro Pro Pro Gly Thr Thr Ile Ser Ala Ala Gly Gly Gly Ala Ser
20 25 30

Tyr His His Leu Leu Gln Gln Gln Gln Gln Leu Gln Leu Phe Trp
35 40 45

Thr Tyr Gln Arg Gln Glu Ile Glu Gln Val Asn Asp Phe Lys Asn His
50 55 60

Gln Leu Pro Leu Ala Arg Ile Lys Lys Ile Met Lys Ala Asp Glu Asp
65 70 75 80

Val Arg Met Ile Ser Ala Glu Ala Pro Ile Leu Phe Ala Lys Ala Cys
85 90 95

Glu Leu Phe Ile Leu Glu Leu Thr Ile Arg Ser Trp Leu His Ala Glu
100 105 110

Glu Asn Lys Arg Arg Thr Leu Gln Lys Asn Asp Ile Ala Ala Ala Ile
115 120 125

Thr Arg Thr Asp Ile Phe Asp Phe Leu Val Asp Ile Val Pro Arg Asp
130 135 140

Glu Ile Lys Asp Glu Ala Ala Val Leu Gly Gly Gly Met Val Val Ala
145 150 155 160

Pro Thr Ala Ser Gly Val Pro Tyr Tyr Tyr Pro Pro Met Gly Gln Pro
165 170 175

Ala Gly Pro Gly Gly Met Met Ile Gly Arg Pro Ala Met Asp Pro Asn
180 185 190

Gly Val Tyr Val Gln Pro Pro Ser Gln Ala Trp Gln Ser Val Trp Gln
195 200 205

```
Thr Ser Thr Gly Thr Gly Asp Asp Val Ser Tyr Gly Ser Gly Gly Ser
    210                 215                 220

Ser Gly Gln Gly Asn Leu Asp Gly Gln Gly
225                 230
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atgattgata gggaaagaga gagagatgaa agaaagtaaa atatataata gattattagg    120

acacgagtgt catcttttga tttgtgtctt gtgtgctctc tctttcttct cttcctcgaa    180

tgatcatctt tatataaccc tactctcttt ctcttttccc attctttcat atcattctcc    240

ctttctctct cgggatctga tctctctttc cagtaaccta ttcccgagga gcactgtcaa    300

atcttgtcca ctctttgatc ttatctcgat ctctttctct ttctagtctt gtgtagtctt    360

caaacttgtg atgttatcta tatagtaatc acgagagaga atcatacaat agctgaaaca    420

taaagctttc ttagaagctt taaaaaggtc tcatctggat tatcctgttt aatttctaga    480

gtttcttcag gcagattatt aaccgatcaa gaagacaaac atg aat tca ttt tcc      535
                                              Met Asn Ser Phe Ser
                                              1               5

cac gtc cct ccg ggt ttt aga ttt cac ccg aca gat gaa gaa ctt gta      583
His Val Pro Pro Gly Phe Arg Phe His Pro Thr Asp Glu Glu Leu Val
                10                  15                  20

gac tac tac ctg agg aaa aaa gtc gca tcg aag aga ata gaa att gat      631
Asp Tyr Tyr Leu Arg Lys Lys Val Ala Ser Lys Arg Ile Glu Ile Asp
            25                  30                  35

ttc ata aag gac att gat ctt tac aag att gag cca tgg gac ctt caa      679
Phe Ile Lys Asp Ile Asp Leu Tyr Lys Ile Glu Pro Trp Asp Leu Gln
        40                  45                  50

gag ttg tgc aaa att ggg cat gaa gag cag agt gat tgg tac ttc ttt      727
Glu Leu Cys Lys Ile Gly His Glu Glu Gln Ser Asp Trp Tyr Phe Phe
    55                  60                  65

agc cat aaa gac aag aag tat ccc aca ggg act cga acc aat aga gca      775
Ser His Lys Asp Lys Lys Tyr Pro Thr Gly Thr Arg Thr Asn Arg Ala
70                  75                  80                  85

aca aaa gca ggg ttt tgg aaa gcc acc gga aga gat aag gct atc tat      823
Thr Lys Ala Gly Phe Trp Lys Ala Thr Gly Arg Asp Lys Ala Ile Tyr
                90                  95                  100

ttg agg cat agt cta att ggc atg agg aaa aca ctt gtg ttt tac aag      871
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Leu Arg His Ser Leu Ile Gly Met Arg Lys Thr Leu Val Phe Tyr Lys
            105                 110                 115

gga aga gcc cca aat gga caa aag tct gat tgg atc atg cac gaa tac      919
Gly Arg Ala Pro Asn Gly Gln Lys Ser Asp Trp Ile Met His Glu Tyr
        120                 125                 130

cgc tta gaa acc gat gaa aac gga act cct cag gaa gaa gga tgg gtt      967
Arg Leu Glu Thr Asp Glu Asn Gly Thr Pro Gln Glu Glu Gly Trp Val
    135                 140                 145

gtg tgt agg gtt ttc aag aag aga ttg gct gca gtt aga cga atg gga     1015
Val Cys Arg Val Phe Lys Lys Arg Leu Ala Ala Val Arg Arg Met Gly
150                 155                 160                 165

gat tac gac tca tcc cct tca cat tgg tac gat gat caa ctt tct ttt     1063
Asp Tyr Asp Ser Ser Pro Ser His Trp Tyr Asp Asp Gln Leu Ser Phe
                170                 175                 180

atg gcc tcc gag ctc gag aca aac ggt caa cga cgg att ctc ccc aat     1111
Met Ala Ser Glu Leu Glu Thr Asn Gly Gln Arg Arg Ile Leu Pro Asn
            185                 190                 195

cat cat cag cag cag cag cac gag cac caa caa cat atg cca tat ggc     1159
His His Gln Gln Gln Gln His Glu His Gln Gln His Met Pro Tyr Gly
        200                 205                 210

ctc aat gca tct gct tac gct ctc aac aac cct aac ttg caa tgc aag     1207
Leu Asn Ala Ser Ala Tyr Ala Leu Asn Asn Pro Asn Leu Gln Cys Lys
    215                 220                 225

caa gag cta gaa cta cac tac aac cac ctg caa tca aat atc gcg cat     1255
Gln Glu Leu Glu Leu His Tyr Asn His Leu Gln Ser Asn Ile Ala His
230                 235                 240                 245

gag gaa caa ttg aat caa gga aat cag aac ttc agc tct cta tac atg     1303
Glu Glu Gln Leu Asn Gln Gly Asn Gln Asn Phe Ser Ser Leu Tyr Met
                250                 255                 260

aac agc ggc aac gag caa gtg atg gac caa gtc aca gac tgg aga gtt     1351
Asn Ser Gly Asn Glu Gln Val Met Asp Gln Val Thr Asp Trp Arg Val
            265                 270                 275

ctc gat aaa ttt gtt gct tct cag cta agc aac gag gag gct gcc aca     1399
Leu Asp Lys Phe Val Ala Ser Gln Leu Ser Asn Glu Glu Ala Ala Thr
        280                 285                 290

gct tct gca tct ata cag aat aat gcc aag gac aca agc aat gct gag     1447
Ala Ser Ala Ser Ile Gln Asn Asn Ala Lys Asp Thr Ser Asn Ala Glu
    295                 300                 305

tac caa gtt gat gaa gaa aaa gat ccg aaa agg gct tca gac atg gga     1495
Tyr Gln Val Asp Glu Glu Lys Asp Pro Lys Arg Ala Ser Asp Met Gly
310                 315                 320                 325

gaa gaa tat act gct tct act tct tcg agt tgt cag att gat cta tgg     1543
Glu Glu Tyr Thr Ala Ser Thr Ser Ser Ser Cys Gln Ile Asp Leu Trp
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330 335 340

aag tga gctgaaagag aagacatata aatgcatata tacatatata tatatacgta 1599
Lys

cacacgaaca ctaatcaagt gtagatgatg atgatggtac agatttatat ttgctttgat 1659

tgattcttac tacattattg aacttatgtc atatgcatat atacattgcg tatctatgca 1719

tatttatact tgtactcaat atgattaacc atatataaac tctaatctaa atgtaactcc 1779

aatatttttt aaatagacaa ttgtctcttc ttattagaaa aaaaa 1824

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Met Asn Ser Phe Ser His Val Pro Pro Gly Phe Arg Phe His Pro Thr
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Asp Glu Glu Leu Val Asp Tyr Tyr Leu Arg Lys Lys Val Ala Ser Lys
20 25 30

Arg Ile Glu Ile Asp Phe Ile Lys Asp Ile Asp Leu Tyr Lys Ile Glu
35 40 45

Pro Trp Asp Leu Gln Glu Leu Cys Lys Ile Gly His Glu Glu Gln Ser
50 55 60

Asp Trp Tyr Phe Phe Ser His Lys Asp Lys Lys Tyr Pro Thr Gly Thr
65 70 75 80

Arg Thr Asn Arg Ala Thr Lys Ala Gly Phe Trp Lys Ala Thr Gly Arg
85 90 95

Asp Lys Ala Ile Tyr Leu Arg His Ser Leu Ile Gly Met Arg Lys Thr
100 105 110

Leu Val Phe Tyr Lys Gly Arg Ala Pro Asn Gly Gln Lys Ser Asp Trp
115 120 125

Ile Met His Glu Tyr Arg Leu Glu Thr Asp Glu Asn Gly Thr Pro Gln
130 135 140

Glu Glu Gly Trp Val Val Cys Arg Val Phe Lys Lys Arg Leu Ala Ala
145 150 155 160

Val Arg Arg Met Gly Asp Tyr Asp Ser Ser Pro Ser His Trp Tyr Asp
165 170 175

Asp Gln Leu Ser Phe Met Ala Ser Glu Leu Glu Thr Asn Gly Gln Arg
180 185 190

Arg Ile Leu Pro Asn His His Gln Gln Gln Gln His Glu His Gln Gln
195 200 205

His Met Pro Tyr Gly Leu Asn Ala Ser Ala Tyr Ala Leu Asn Asn Pro
210 215 220

Asn Leu Gln Cys Lys Gln Glu Leu Glu Leu His Tyr Asn His Leu Gln
225 230 235 240

Ser Asn Ile Ala His Glu Glu Gln Leu Asn Gln Gly Asn Gln Asn Phe
245 250 255

Ser Ser Leu Tyr Met Asn Ser Gly Asn Glu Gln Val Met Asp Gln Val
260 265 270

Thr Asp Trp Arg Val Leu Asp Lys Phe Val Ala Ser Gln Leu Ser Asn
275 280 285

Glu Glu Ala Ala Thr Ala Ser Ala Ser Ile Gln Asn Asn Ala Lys Asp
290 295 300

Thr Ser Asn Ala Glu Tyr Gln Val Asp Glu Glu Lys Asp Pro Lys Arg
305 310 315 320

Ala Ser Asp Met Gly Glu Glu Tyr Thr Ala Ser Thr Ser Ser Ser Cys
325 330 335

Gln Ile Asp Leu Trp Lys
340

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tttgttttca aaagaaacga tttttagtag ccgccgggga atcaggaga atg gtg tct 118
Met Val Ser
1

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ccg gag aat acg aac tgg ctt agt gat tac cct ttg att gaa ggt gct      166
Pro Glu Asn Thr Asn Trp Leu Ser Asp Tyr Pro Leu Ile Glu Gly Ala
    5                   10                  15

ttc tct gat cag aac ccc act ttc cct tgg cag ata gat ggc tca gct      214
Phe Ser Asp Gln Asn Pro Thr Phe Pro Trp Gln Ile Asp Gly Ser Ala
20                  25                  30                  35

act gtc agt gtt gaa gtg gat ggc ttc ctt tgt gat gca gat gtg atc      262
Thr Val Ser Val Glu Val Asp Gly Phe Leu Cys Asp Ala Asp Val Ile
                40                  45                  50

aaa gaa cca agt tca agg aag agg atc aaa act gaa tct tgc act ggt      310
Lys Glu Pro Ser Ser Arg Lys Arg Ile Lys Thr Glu Ser Cys Thr Gly
            55                  60                  65

tct aac tcg aaa gct tgt agg gag aaa caa aga cgt gat aga cta aat      358
Ser Asn Ser Lys Ala Cys Arg Glu Lys Gln Arg Arg Asp Arg Leu Asn
        70                  75                  80

gac aag ttt acg gag ttg agt tcc gta ttg gaa cct ggg aga act cca      406
Asp Lys Phe Thr Glu Leu Ser Ser Val Leu Glu Pro Gly Arg Thr Pro
    85                  90                  95

aaa aca gac aag gtt gct att atc aat gat gca att cgc atg gtg aat      454
Lys Thr Asp Lys Val Ala Ile Ile Asn Asp Ala Ile Arg Met Val Asn
100                 105                 110                 115

caa gca aga gat gaa gcg cag aaa cta aag gac ttg aac tca agc ctc      502
Gln Ala Arg Asp Glu Ala Gln Lys Leu Lys Asp Leu Asn Ser Ser Leu
                120                 125                 130

cag gag aaa atc aag gag ttg aag gat gag aag aac gag ctg cgt gat      550
Gln Glu Lys Ile Lys Glu Leu Lys Asp Glu Lys Asn Glu Leu Arg Asp
            135                 140                 145

gag aaa cag aag ctt aag gtc gag aag gag aga atc gat cag caa ctg      598
Glu Lys Gln Lys Leu Lys Val Glu Lys Glu Arg Ile Asp Gln Gln Leu
        150                 155                 160

aaa gct att aag aca cag cct cag cct caa cct tgt ttc tta cca aat      646
Lys Ala Ile Lys Thr Gln Pro Gln Pro Gln Pro Cys Phe Leu Pro Asn
    165                 170                 175

ccg caa aca ctc tct caa gct caa gct cct gga agc aag ctt gtc cct      694
Pro Gln Thr Leu Ser Gln Ala Gln Ala Pro Gly Ser Lys Leu Val Pro
180                 185                 190                 195

ttc aca act tat ccc ggc ttt gca atg tgg caa ttc atg cct cct gct      742
Phe Thr Thr Tyr Pro Gly Phe Ala Met Trp Gln Phe Met Pro Pro Ala
                200                 205                 210

gct gtt gat acc tca cag gac cat gtc ctt cgt cct cca gtt gct taa      790
Ala Val Asp Thr Ser Gln Asp His Val Leu Arg Pro Pro Val Ala
            215                 220                 225
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agctgctgct tctctctact actattaacg gttctgtaag attacttctt acgcgctttt 850

ttctgatgta atgattctca cattctgtga ttggtgacat agtccactgc aacttaaaat 910

gtaaaattga aataagcttg cactaaaaat caaatctcat tgtgcaaaaa gttggataat 970

ttggaaatca ttgttttaca aaaaaaaaac cccccgag 1008

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Met Val Ser Pro Glu Asn Thr Asn Trp Leu Ser Asp Tyr Pro Leu Ile
1 5 10 15

Glu Gly Ala Phe Ser Asp Gln Asn Pro Thr Phe Pro Trp Gln Ile Asp
20 25 30

Gly Ser Ala Thr Val Ser Val Glu Val Asp Gly Phe Leu Cys Asp Ala
35 40 45

Asp Val Ile Lys Glu Pro Ser Ser Arg Lys Arg Ile Lys Thr Glu Ser
50 55 60

Cys Thr Gly Ser Asn Ser Lys Ala Cys Arg Glu Lys Gln Arg Arg Asp
65 70 75 80

Arg Leu Asn Asp Lys Phe Thr Glu Leu Ser Ser Val Leu Glu Pro Gly
85 90 95

Arg Thr Pro Lys Thr Asp Lys Val Ala Ile Ile Asn Asp Ala Ile Arg
100 105 110

Met Val Asn Gln Ala Arg Asp Glu Ala Gln Lys Leu Lys Asp Leu Asn
115 120 125

Ser Ser Leu Gln Glu Lys Ile Lys Glu Leu Lys Asp Glu Lys Asn Glu
130 135 140

Leu Arg Asp Glu Lys Gln Lys Leu Lys Val Glu Lys Glu Arg Ile Asp
145 150 155 160

Gln Gln Leu Lys Ala Ile Lys Thr Gln Pro Gln Pro Gln Pro Cys Phe
165 170 175

Leu Pro Asn Pro Gln Thr Leu Ser Gln Ala Gln Ala Pro Gly Ser Lys
180 185 190

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Leu Val Pro Phe Thr Thr Tyr Pro Gly Phe Ala Met Trp Gln Phe Met
        195                 200                 205

Pro Pro Ala Ala Val Asp Thr Ser Gln Asp His Val Leu Arg Pro Pro
    210                 215                 220

Val Ala
225
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                                  Met Asn Leu Phe Thr Arg Ile
                                  1               5

tca tct cgg act aag aag gcc aat ctt tac tac gta acc cta gtt gct      160
Ser Ser Arg Thr Lys Lys Ala Asn Leu Tyr Tyr Val Thr Leu Val Ala
        10                  15                  20

ctt ctc tgc atc gct agc tac ctt ctc ggt att tgg caa aac acg gcg      208
Leu Leu Cys Ile Ala Ser Tyr Leu Leu Gly Ile Trp Gln Asn Thr Ala
    25                  30                  35

gtt aat cca cgc gcc gcc ttc gat gat tca gac ggt aca ccg tgc gag      256
Val Asn Pro Arg Ala Ala Phe Asp Asp Ser Asp Gly Thr Pro Cys Glu
40                  45                  50                  55

gga ttc acc aga cct aat tct acg aaa gat ctc gac ttc gac gcg cat      304
Gly Phe Thr Arg Pro Asn Ser Thr Lys Asp Leu Asp Phe Asp Ala His
                60                  65                  70

cac aac att caa gat cca cct ccg gtg acg gaa acc gcc gtt agt ttc      352
His Asn Ile Gln Asp Pro Pro Pro Val Thr Glu Thr Ala Val Ser Phe
            75                  80                  85

ccg tcg tgt gcc gcc gcg ttg agc gag cac acg cca tgc gaa gac gcg      400
Pro Ser Cys Ala Ala Ala Leu Ser Glu His Thr Pro Cys Glu Asp Ala
        90                  95                  100

aag cga tcg ttg aaa ttc tcg agg gag aga ttg gag tat agg caa agg      448
Lys Arg Ser Leu Lys Phe Ser Arg Glu Arg Leu Glu Tyr Arg Gln Arg
    105                 110                 115

cat tgt ccc gag aga gaa gaa atc ttg aag tgc aga att ccg gcg ccg      496
His Cys Pro Glu Arg Glu Glu Ile Leu Lys Cys Arg Ile Pro Ala Pro
120                 125                 130                 135

tac ggt tac aaa acg ccg ttc cga tgg ccg gcg agt cgt gac gtg gcg      544
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Tyr Gly Tyr Lys Thr Pro Phe Arg Trp Pro Ala Ser Arg Asp Val Ala
                140                 145                 150

tgg ttc gct aat gtg cct cac acg gag ctt acg gtt gag aaa aag aat      592
Trp Phe Ala Asn Val Pro His Thr Glu Leu Thr Val Glu Lys Lys Asn
            155                 160                 165

cag aat tgg gtc cgg tac gag aat gat cgg ttt tgg ttc cct ggt gga      640
Gln Asn Trp Val Arg Tyr Glu Asn Asp Arg Phe Trp Phe Pro Gly Gly
        170                 175                 180

ggt acg atg ttt cca cgt ggc gct gat gct tac att gat gat atc gga      688
Gly Thr Met Phe Pro Arg Gly Ala Asp Ala Tyr Ile Asp Asp Ile Gly
    185                 190                 195

cgg ttg att gat ctc agc gac ggc tct atc cgt aca gcc atc gat acc      736
Arg Leu Ile Asp Leu Ser Asp Gly Ser Ile Arg Thr Ala Ile Asp Thr
200                 205                 210                 215

ggt tgc ggg gtg gct agc ttc ggt gca tat ctt tta tca aga aac att      784
Gly Cys Gly Val Ala Ser Phe Gly Ala Tyr Leu Leu Ser Arg Asn Ile
                220                 225                 230

aca acg atg tca ttt gca cca aga gac aca cac gaa gct caa gtc cag      832
Thr Thr Met Ser Phe Ala Pro Arg Asp Thr His Glu Ala Gln Val Gln
            235                 240                 245

ttc gca ctc gag cgt ggt gtg ccg gcg atg atc gga atc atg gct aca      880
Phe Ala Leu Glu Arg Gly Val Pro Ala Met Ile Gly Ile Met Ala Thr
        250                 255                 260

atc cgc cta ccg tac cct tct aga gcc ttt gat tta gca cat tgc tct      928
Ile Arg Leu Pro Tyr Pro Ser Arg Ala Phe Asp Leu Ala His Cys Ser
    265                 270                 275

cgt tgc ctt att ccg tgg ggc caa aac gat ggg gct tac ttg atg gag      976
Arg Cys Leu Ile Pro Trp Gly Gln Asn Asp Gly Ala Tyr Leu Met Glu
280                 285                 290                 295

gtg gat agg gtt tta aga cca gga ggg tac tgg ata ctt tct gga ccg     1024
Val Asp Arg Val Leu Arg Pro Gly Gly Tyr Trp Ile Leu Ser Gly Pro
                300                 305                 310

ccg att aat tgg cag aaa cgg tgg aaa ggg tgg gaa cgg acc atg gat     1072
Pro Ile Asn Trp Gln Lys Arg Trp Lys Gly Trp Glu Arg Thr Met Asp
            315                 320                 325

gat ttg aat gca gag cag act cag atc gag cag gtc gcg aga agc ttg     1120
Asp Leu Asn Ala Glu Gln Thr Gln Ile Glu Gln Val Ala Arg Ser Leu
        330                 335                 340

tgt tgg aag aaa gtt gtt caa aga gat gat ctt gct att tgg caa aaa     1168
Cys Trp Lys Lys Val Val Gln Arg Asp Asp Leu Ala Ile Trp Gln Lys
    345                 350                 355

ccc ttt aac cac att gac tgt aag aaa acc aga gag gtt ttg aaa aat     1216
Pro Phe Asn His Ile Asp Cys Lys Lys Thr Arg Glu Val Leu Lys Asn
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360                 365                 370                 375

ccg gag ttt tgt cgt cat gat caa gat ccc gac atg gcc tgg tat acg     1264
Pro Glu Phe Cys Arg His Asp Gln Asp Pro Asp Met Ala Trp Tyr Thr
                380                 385                 390

aag atg gat tct tgt ttg aca cca tta cct gaa gtt gat gac gct gag     1312
Lys Met Asp Ser Cys Leu Thr Pro Leu Pro Glu Val Asp Asp Ala Glu
            395                 400                 405

gat cta aag acg gtg gcc gga ggg aag gta gaa aag tgg ccg gct aga     1360
Asp Leu Lys Thr Val Ala Gly Gly Lys Val Glu Lys Trp Pro Ala Arg
        410                 415                 420

tta aac gcg att cct ccg aga gta aac aaa ggc gct ctc gag gaa atc     1408
Leu Asn Ala Ile Pro Pro Arg Val Asn Lys Gly Ala Leu Glu Glu Ile
    425                 430                 435

aca cct gaa gct ttc ttg gag aac acg aaa ctg tgg aaa cag aga gtt     1456
Thr Pro Glu Ala Phe Leu Glu Asn Thr Lys Leu Trp Lys Gln Arg Val
440                 445                 450                 455

tct tat tac aag aag tta gat tac cag ttg ggt gaa acc ggg aga tac     1504
Ser Tyr Tyr Lys Lys Leu Asp Tyr Gln Leu Gly Glu Thr Gly Arg Tyr
                460                 465                 470

aga aac tta gtc gac atg aac gct tac ctc ggt gga ttc gcg gcg gct     1552
Arg Asn Leu Val Asp Met Asn Ala Tyr Leu Gly Gly Phe Ala Ala Ala
            475                 480                 485

cta gcg gat gat ccg gtc tgg gtc atg aac gtt gtc ccg gtc gag gct     1600
Leu Ala Asp Asp Pro Val Trp Val Met Asn Val Val Pro Val Glu Ala
        490                 495                 500

aag ctc aat acg ctc ggt gtc atc tac gag cgt ggt cta atc gga acg     1648
Lys Leu Asn Thr Leu Gly Val Ile Tyr Glu Arg Gly Leu Ile Gly Thr
    505                 510                 515

tat caa aac tgg tgt gaa gcc atg tcg acg tat cca aga acg tat gat     1696
Tyr Gln Asn Trp Cys Glu Ala Met Ser Thr Tyr Pro Arg Thr Tyr Asp
520                 525                 530                 535

ttt atc cat gct gac tcg gtt ttc aca ttg tac caa ggt caa tgt gaa     1744
Phe Ile His Ala Asp Ser Val Phe Thr Leu Tyr Gln Gly Gln Cys Glu
                540                 545                 550

ccg gag gag ata ttg ttg gag atg gac cga att ctt aga ccg ggt ggt     1792
Pro Glu Glu Ile Leu Leu Glu Met Asp Arg Ile Leu Arg Pro Gly Gly
            555                 560                 565

ggt gtg att ata aga gat gac gtg gac gtt ttg atc aag gtt aag gaa     1840
Gly Val Ile Ile Arg Asp Asp Val Asp Val Leu Ile Lys Val Lys Glu
        570                 575                 580

tta acc aaa gga tta gaa tgg gaa ggt aga att gct gac cac gag aag     1888
Leu Thr Lys Gly Leu Glu Trp Glu Gly Arg Ile Ala Asp His Glu Lys
    585                 590                 595
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ggt cct cat gaa aga gag aag att tac tat gcg gtg aaa cag tat tgg 1936
Gly Pro His Glu Arg Glu Lys Ile Tyr Tyr Ala Val Lys Gln Tyr Trp
600 605 610 615

acc gtt cct gcg cct gat gaa gat aaa aac aac act agt gct ctc tcc 1984
Thr Val Pro Ala Pro Asp Glu Asp Lys Asn Asn Thr Ser Ala Leu Ser
620 625 630

tga tttttgagtt tttttttttct tacaatgttt ttttttttttt tttttcaatt 2037

ttttatacaa caataaattc tcaataattg ttgtcgcggc cg 2079

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Met Asn Leu Phe Thr Arg Ile Ser Ser Arg Thr Lys Lys Ala Asn Leu
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Tyr Tyr Val Thr Leu Val Ala Leu Leu Cys Ile Ala Ser Tyr Leu Leu
20 25 30

Gly Ile Trp Gln Asn Thr Ala Val Asn Pro Arg Ala Ala Phe Asp Asp
35 40 45

Ser Asp Gly Thr Pro Cys Glu Gly Phe Thr Arg Pro Asn Ser Thr Lys
50 55 60

Asp Leu Asp Phe Asp Ala His His Asn Ile Gln Asp Pro Pro Pro Val
65 70 75 80

Thr Glu Thr Ala Val Ser Phe Pro Ser Cys Ala Ala Ala Leu Ser Glu
85 90 95

His Thr Pro Cys Glu Asp Ala Lys Arg Ser Leu Lys Phe Ser Arg Glu
100 105 110

Arg Leu Glu Tyr Arg Gln Arg His Cys Pro Glu Arg Glu Glu Ile Leu
115 120 125

Lys Cys Arg Ile Pro Ala Pro Tyr Gly Tyr Lys Thr Pro Phe Arg Trp
130 135 140

Pro Ala Ser Arg Asp Val Ala Trp Phe Ala Asn Val Pro His Thr Glu
145 150 155 160

Leu Thr Val Glu Lys Lys Asn Gln Asn Trp Val Arg Tyr Glu Asn Asp

165 170 175

Arg Phe Trp Phe Pro Gly Gly Gly Thr Met Phe Pro Arg Gly Ala Asp
180 185 190

Ala Tyr Ile Asp Asp Ile Gly Arg Leu Ile Asp Leu Ser Asp Gly Ser
195 200 205

Ile Arg Thr Ala Ile Asp Thr Gly Cys Gly Val Ala Ser Phe Gly Ala
210 215 220

Tyr Leu Leu Ser Arg Asn Ile Thr Thr Met Ser Phe Ala Pro Arg Asp
225 230 235 240

Thr His Glu Ala Gln Val Gln Phe Ala Leu Glu Arg Gly Val Pro Ala
245 250 255

Met Ile Gly Ile Met Ala Thr Ile Arg Leu Pro Tyr Pro Ser Arg Ala
260 265 270

Phe Asp Leu Ala His Cys Ser Arg Cys Leu Ile Pro Trp Gly Gln Asn
275 280 285

Asp Gly Ala Tyr Leu Met Glu Val Asp Arg Val Leu Arg Pro Gly Gly
290 295 300

Tyr Trp Ile Leu Ser Gly Pro Pro Ile Asn Trp Gln Lys Arg Trp Lys
305 310 315 320

Gly Trp Glu Arg Thr Met Asp Asp Leu Asn Ala Glu Gln Thr Gln Ile
325 330 335

Glu Gln Val Ala Arg Ser Leu Cys Trp Lys Lys Val Val Gln Arg Asp
340 345 350

Asp Leu Ala Ile Trp Gln Lys Pro Phe Asn His Ile Asp Cys Lys Lys
355 360 365

Thr Arg Glu Val Leu Lys Asn Pro Glu Phe Cys Arg His Asp Gln Asp
370 375 380

Pro Asp Met Ala Trp Tyr Thr Lys Met Asp Ser Cys Leu Thr Pro Leu
385 390 395 400

Pro Glu Val Asp Asp Ala Glu Asp Leu Lys Thr Val Ala Gly Gly Lys
405 410 415

Val Glu Lys Trp Pro Ala Arg Leu Asn Ala Ile Pro Pro Arg Val Asn
420 425 430

Lys Gly Ala Leu Glu Glu Ile Thr Pro Glu Ala Phe Leu Glu Asn Thr
435 440 445

Lys Leu Trp Lys Gln Arg Val Ser Tyr Tyr Lys Lys Leu Asp Tyr Gln
450 455 460

Leu Gly Glu Thr Gly Arg Tyr Arg Asn Leu Val Asp Met Asn Ala Tyr
465 470 475 480

Leu Gly Gly Phe Ala Ala Ala Leu Ala Asp Asp Pro Val Trp Val Met
485 490 495

Asn Val Val Pro Val Glu Ala Lys Leu Asn Thr Leu Gly Val Ile Tyr
500 505 510

Glu Arg Gly Leu Ile Gly Thr Tyr Gln Asn Trp Cys Glu Ala Met Ser
515 520 525

Thr Tyr Pro Arg Thr Tyr Asp Phe Ile His Ala Asp Ser Val Phe Thr
530 535 540

Leu Tyr Gln Gly Gln Cys Glu Pro Glu Glu Ile Leu Leu Glu Met Asp
545 550 555 560

Arg Ile Leu Arg Pro Gly Gly Gly Val Ile Ile Arg Asp Asp Val Asp
565 570 575

Val Leu Ile Lys Val Lys Glu Leu Thr Lys Gly Leu Glu Trp Glu Gly
580 585 590

Arg Ile Ala Asp His Glu Lys Gly Pro His Glu Arg Glu Lys Ile Tyr
595 600 605

Tyr Ala Val Lys Gln Tyr Trp Thr Val Pro Ala Pro Asp Glu Asp Lys
610 615 620

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Asn Asn Thr Ser Ala Leu Ser
625                 630
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<222> (238)..(2010) <223> G833

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Application as filed

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Met Glu Leu His Glu Lys Val Ser Glu Val Glu Gly Val Lys Ile Ala
180 185 190

aac aag aat tct ctt ctc aca aat ggt cta gac atg aga gat acc tcg 743

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Asn Lys Asn Ser Leu Leu Thr Asn Gly Leu Asp Met Arg Asp Thr Ser
    195                 200                 205

aac gaa cat gtc cat ctt cag ctc agc caa ccg cag cat gat cat gag      791
Asn Glu His Val His Leu Gln Leu Ser Gln Pro Gln His Asp His Glu
210                 215                 220                 225

acg cat tca aaa gct atc caa ctc aac tat ttt tcc ttc att gca taa      839
Thr His Ser Lys Ala Ile Gln Leu Asn Tyr Phe Ser Phe Ile Ala
                230                 235                 240

tataattcgg tgtgccaaca cacttatgtt gacctcgtcg gaatcatatc acaattcact    899

gtgtcagctt gcctctgcat aagcgaaaat aaaaacataa acatgatcag tttgcattcc    959

atatctatca aacaccagct ttgtaacttt taaaactttt tctccgtgca aagacctttg   1019

gtttggcgct taagcatgta gtttgatgat caaaggaaat gggtgtttta gcataaagtt   1079

gtcacccttc cgttgcattt tagcttccca tccaaatcaa tttgtaaaat gtgagttagt   1139

ttgcagcatg aaagctgatt aaatatcagt cccgttatca caagaggtaa aaaaaaaaaa   1199

aaaaaaaaaa a                                                       1210


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Met Gly Arg Gly Lys Ile Ala Ile Lys Arg Ile Asn Asn Ser Thr Ser
1               5                   10                  15

Arg Gln Val Thr Phe Ser Lys Arg Arg Asn Gly Leu Leu Lys Lys Ala
            20                  25                  30

Lys Glu Leu Ala Ile Leu Cys Asp Ala Glu Val Gly Val Ile Ile Phe
        35                  40                  45

Ser Ser Thr Gly Arg Leu Tyr Asp Phe Ser Ser Ser Ser Met Lys Ser
    50                  55                  60

Val Ile Glu Arg Tyr Ser Asp Ala Lys Gly Glu Thr Ser Ser Glu Asn
65                  70                  75                  80

Asp Pro Ala Ser Glu Ile Gln Phe Trp Gln Lys Glu Ala Ala Ile Leu
                85                  90                  95

Lys Arg Gln Leu His Asn Leu Gln Glu Asn His Arg Gln Met Met Gly
            100                 105                 110

Glu Glu Leu Ser Gly Leu Ser Val Glu Ala Leu Gln Asn Leu Glu Asn
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Replacement Sheet

115 120 125

Gln Leu Glu Leu Ser Leu Arg Gly Val Arg Met Lys Lys Asp Gln Met
130 135 140

Leu Ile Glu Glu Ile Gln Val Leu Asn Arg Glu Gly Asn Leu Val His
145 150 155 160

Gln Glu Asn Leu Asp Leu His Lys Lys Val Asn Leu Met His Gln Gln
165 170 175

Asn Met Glu Leu His Glu Lys Val Ser Glu Val Glu Gly Val Lys Ile
180 185 190

Ala Asn Lys Asn Ser Leu Leu Thr Asn Gly Leu Asp Met Arg Asp Thr
195 200 205

Ser Asn Glu His Val His Leu Gln Leu Ser Gln Pro Gln His Asp His
210 215 220

Glu Thr His Ser Lys Ala Ile Gln Leu Asn Tyr Phe Ser Phe Ile Ala
225 230 235 240

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<222> (59)..(1645) <223> G916

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atg ttt cgt ttt ccg gta agt ctt gga gga ggt cca cgt gag aat ctg 106
Met Phe Arg Phe Pro Val Ser Leu Gly Gly Gly Pro Arg Glu Asn Leu
1 5 10 15

aag cca tca gat gag cag cat caa cgt gcg gtg gtg aat gag gtt gac 154
Lys Pro Ser Asp Glu Gln His Gln Arg Ala Val Val Asn Glu Val Asp
20 25 30

ttt ttc cga tca gcg gag aag aga gat agg gtt tca cgt gaa gaa caa 202
Phe Phe Arg Ser Ala Glu Lys Arg Asp Arg Val Ser Arg Glu Glu Gln
35 40 45

aac att atc gcc gat gag act cat agg gtt cat gtc aaa agg gag aat 250
Asn Ile Ile Ala Asp Glu Thr His Arg Val His Val Lys Arg Glu Asn
50 55 60

tca cgt gtt gat gat cat gac gat cgt tct act gat cac atc aat att 298
Ser Arg Val Asp Asp His Asp Asp Arg Ser Thr Asp His Ile Asn Ile
65 70 75 80

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gga ctt aat ctt ctc act gcg aat acg gga agc gac gag tca atg gtg      346
Gly Leu Asn Leu Leu Thr Ala Asn Thr Gly Ser Asp Glu Ser Met Val
                85                  90                  95

gat gat gga ttg tct gtg gat atg gaa gag aaa cgt aca aag tgt gag      394
Asp Asp Gly Leu Ser Val Asp Met Glu Glu Lys Arg Thr Lys Cys Glu
            100                 105                 110

aat gca caa ctt cgc gaa gag cta aag aag gcg agt gaa gat aat caa      442
Asn Ala Gln Leu Arg Glu Glu Leu Lys Lys Ala Ser Glu Asp Asn Gln
        115                 120                 125

aga cta aag caa atg cta agt caa aca acc aac aac ttc aat tcc ttg      490
Arg Leu Lys Gln Met Leu Ser Gln Thr Thr Asn Asn Phe Asn Ser Leu
    130                 135                 140

cag atg caa ctt gtt gct gtc atg agg caa caa gaa gat cat cat cac      538
Gln Met Gln Leu Val Ala Val Met Arg Gln Gln Glu Asp His His His
145                 150                 155                 160

cta gct acg acc gag aac aat gac aat gta aag aac cga cat gaa gtg      586
Leu Ala Thr Thr Glu Asn Asn Asp Asn Val Lys Asn Arg His Glu Val
                165                 170                 175

cct gaa atg gtt cca aga cag ttc atc gat ttg gga ccg cat tct gac      634
Pro Glu Met Val Pro Arg Gln Phe Ile Asp Leu Gly Pro His Ser Asp
            180                 185                 190

gaa gtg tcg tcc gag gag agg acg acg gtt cgg tcg gga tct cct ccc      682
Glu Val Ser Ser Glu Glu Arg Thr Thr Val Arg Ser Gly Ser Pro Pro
        195                 200                 205

tcg ctt cta gag aaa tct agc tca cgt caa aac gga aag aga gtg ctt      730
Ser Leu Leu Glu Lys Ser Ser Ser Arg Gln Asn Gly Lys Arg Val Leu
    210                 215                 220

gta aga gaa gaa agc ccg gaa acc gaa tcc aac ggc tgg aga aac cct      778
Val Arg Glu Glu Ser Pro Glu Thr Glu Ser Asn Gly Trp Arg Asn Pro
225                 230                 235                 240

aac aaa gtt cct aaa cac cat gca tca tcc agc att tgc ggt ggc aat      826
Asn Lys Val Pro Lys His His Ala Ser Ser Ser Ile Cys Gly Gly Asn
                245                 250                 255

ggc agt gaa aat gca agt agc aag gtc att gag caa gcg gcc gcc gaa      874
Gly Ser Glu Asn Ala Ser Ser Lys Val Ile Glu Gln Ala Ala Ala Glu
            260                 265                 270

gcc acc atg cgt aaa gcc cgt gtc tcg gtt cgt gct cga tcc gaa gct      922
Ala Thr Met Arg Lys Ala Arg Val Ser Val Arg Ala Arg Ser Glu Ala
        275                 280                 285

ccc atg tta agc gat gga tgt caa tgg aga aaa tac gga caa aaa atg      970
Pro Met Leu Ser Asp Gly Cys Gln Trp Arg Lys Tyr Gly Gln Lys Met
    290                 295                 300

gcg aaa gga aac ccg tgc cct cga gct tat tac cgt tgc aca atg gct     1018
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Ala Lys Gly Asn Pro Cys Pro Arg Ala Tyr Tyr Arg Cys Thr Met Ala
305                 310                 315                 320

gtt gga tgt cct gtt cgc aag caa gtg caa cgt tgc gcg gaa gat aga     1066
Val Gly Cys Pro Val Arg Lys Gln Val Gln Arg Cys Ala Glu Asp Arg
                325                 330                 335

acc att ctc ata aca acc tac gaa gga aac cat aac cat cca tta cct     1114
Thr Ile Leu Ile Thr Thr Tyr Glu Gly Asn His Asn His Pro Leu Pro
            340                 345                 350

cct gcg gct atg aac atg gct tca act aca aca gca gcc gca agc atg     1162
Pro Ala Ala Met Asn Met Ala Ser Thr Thr Thr Ala Ala Ala Ser Met
        355                 360                 365

ctt ctc tca ggc tcc acc atg tcg aac caa gac ggt tta atg aac cca     1210
Leu Leu Ser Gly Ser Thr Met Ser Asn Gln Asp Gly Leu Met Asn Pro
    370                 375                 380

aca aat ctc ttg gct cga acc ata tta ccg tgt tcc tca agc atg gct     1258
Thr Asn Leu Leu Ala Arg Thr Ile Leu Pro Cys Ser Ser Ser Met Ala
385                 390                 395                 400

act atc tca gcc tct gca cca ttc cca acc att aca tta gac ctc aca     1306
Thr Ile Ser Ala Ser Ala Pro Phe Pro Thr Ile Thr Leu Asp Leu Thr
                405                 410                 415

gag tca ccc aac ggg aac aat cca acc aat aac ccg ctg atg caa ttc     1354
Glu Ser Pro Asn Gly Asn Asn Pro Thr Asn Asn Pro Leu Met Gln Phe
            420                 425                 430

tct caa cgg tct ggt ttg gtg gag ttg aac caa tcg gtt ttg cct cat     1402
Ser Gln Arg Ser Gly Leu Val Glu Leu Asn Gln Ser Val Leu Pro His
        435                 440                 445

atg atg ggt cag gct ttg tac tac aac caa cag tct aag ttt tcg ggt     1450
Met Met Gly Gln Ala Leu Tyr Tyr Asn Gln Gln Ser Lys Phe Ser Gly
    450                 455                 460

tta cat atg ccg tct cag ccg cta aac gct ggt gag agt gtt agc gcc     1498
Leu His Met Pro Ser Gln Pro Leu Asn Ala Gly Glu Ser Val Ser Ala
465                 470                 475                 480

gct act gcc gca atc gcc tcc aat ccc aac ttt gcc gcg gct cta gct     1546
Ala Thr Ala Ala Ile Ala Ser Asn Pro Asn Phe Ala Ala Ala Leu Ala
                485                 490                 495

gca gcc ata act tcg att atc aac ggt tcg aac aat cag cag aat ggg     1594
Ala Ala Ile Thr Ser Ile Ile Asn Gly Ser Asn Asn Gln Gln Asn Gly
            500                 505                 510

aac aac aat aac agt aat gtt aca acg agc aac gtt gac aat agg caa     1642
Asn Asn Asn Asn Ser Asn Val Thr Thr Ser Asn Val Asp Asn Arg Gln
        515                 520                 525

taa catttttta taagttttag ttagggactt tttatcggtc gattttgttt           1695
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tgtttttctt ttattacatt atttttagt tacggctttt ttttgttttt tcttttcttt 1755

cccaaacaac aagtattgag agcaattccc ccccccccc ct 1797

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Met Phe Arg Phe Pro Val Ser Leu Gly Gly Gly Pro Arg Glu Asn Leu
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Lys Pro Ser Asp Glu Gln His Gln Arg Ala Val Val Asn Glu Val Asp
20 25 30

Phe Phe Arg Ser Ala Glu Lys Arg Asp Arg Val Ser Arg Glu Glu Gln
35 40 45

Asn Ile Ile Ala Asp Glu Thr His Arg Val His Val Lys Arg Glu Asn
50 55 60

Ser Arg Val Asp Asp His Asp Asp Arg Ser Thr Asp His Ile Asn Ile
65 70 75 80

Gly Leu Asn Leu Leu Thr Ala Asn Thr Gly Ser Asp Glu Ser Met Val
85 90 95

Asp Asp Gly Leu Ser Val Asp Met Glu Glu Lys Arg Thr Lys Cys Glu
100 105 110

Asn Ala Gln Leu Arg Glu Glu Leu Lys Lys Ala Ser Glu Asp Asn Gln
115 120 125

Arg Leu Lys Gln Met Leu Ser Gln Thr Thr Asn Asn Phe Asn Ser Leu
130 135 140

Gln Met Gln Leu Val Ala Val Met Arg Gln Gln Glu Asp His His His
145 150 155 160

Leu Ala Thr Thr Glu Asn Asn Asp Asn Val Lys Asn Arg His Glu Val
165 170 175

Pro Glu Met Val Pro Arg Gln Phe Ile Asp Leu Gly Pro His Ser Asp
180 185 190

Glu Val Ser Ser Glu Glu Arg Thr Thr Val Arg Ser Gly Ser Pro Pro
195 200 205

Ser Leu Leu Glu Lys Ser Ser Ser Arg Gln Asn Gly Lys Arg Val Leu
210 215 220

Val Arg Glu Glu Ser Pro Glu Thr Glu Ser Asn Gly Trp Arg Asn Pro
225 230 235 240

Asn Lys Val Pro Lys His His Ala Ser Ser Ser Ile Cys Gly Gly Asn
245 250 255

Gly Ser Glu Asn Ala Ser Ser Lys Val Ile Glu Gln Ala Ala Ala Glu
260 265 270

Ala Thr Met Arg Lys Ala Arg Val Ser Val Arg Ala Arg Ser Glu Ala
275 280 285

Pro Met Leu Ser Asp Gly Cys Gln Trp Arg Lys Tyr Gly Gln Lys Met
290 295 300

Ala Lys Gly Asn Pro Cys Pro Arg Ala Tyr Tyr Arg Cys Thr Met Ala
305 310 315 320

Val Gly Cys Pro Val Arg Lys Gln Val Gln Arg Cys Ala Glu Asp Arg
325 330 335

Thr Ile Leu Ile Thr Thr Tyr Glu Gly Asn His Asn His Pro Leu Pro
340 345 350

Pro Ala Ala Met Asn Met Ala Ser Thr Thr Thr Ala Ala Ala Ser Met
355 360 365

Leu Leu Ser Gly Ser Thr Met Ser Asn Gln Asp Gly Leu Met Asn Pro
370 375 380

Thr Asn Leu Leu Ala Arg Thr Ile Leu Pro Cys Ser Ser Ser Met Ala
385 390 395 400

Thr Ile Ser Ala Ser Ala Pro Phe Pro Thr Ile Thr Leu Asp Leu Thr
405 410 415

Glu Ser Pro Asn Gly Asn Asn Pro Thr Asn Asn Pro Leu Met Gln Phe
420 425 430

```
Ser Gln Arg Ser Gly Leu Val Glu Leu Asn Gln Ser Val Leu Pro His
        435                 440                 445

Met Met Gly Gln Ala Leu Tyr Tyr Asn Gln Gln Ser Lys Phe Ser Gly
    450                 455                 460

Leu His Met Pro Ser Gln Pro Leu Asn Ala Gly Glu Ser Val Ser Ala
465                 470                 475                 480

Ala Thr Ala Ala Ile Ala Ser Asn Pro Asn Phe Ala Ala Ala Leu Ala
                485                 490                 495

Ala Ala Ile Thr Ser Ile Ile Asn Gly Ser Asn Asn Gln Gln Asn Gly
            500                 505                 510

Asn Asn Asn Asn Ser Asn Val Thr Thr Ser Asn Val Asp Asn Arg Gln
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Application Number 15/125,360

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<400> 407

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Met Met Met Phe Asn Glu Met Gly Met Tyr Gly Asn Met Asp Phe Phe
1               5                   10                  15

tct tcc tcc aca tct ctc gat gtg tgt cca tta cca caa gct gaa caa      96
Ser Ser Ser Thr Ser Leu Asp Val Cys Pro Leu Pro Gln Ala Glu Gln
            20                  25                  30

gaa cct gta gtt gaa gat gtc gac tac acc gat gat gag atg gat gtg     144
Glu Pro Val Val Glu Asp Val Asp Tyr Thr Asp Asp Glu Met Asp Val
        35                  40                  45

gat gag ctt gag aag agg atg tgg aga gac aaa atg cgt ttg aaa cgt     192
Asp Glu Leu Glu Lys Arg Met Trp Arg Asp Lys Met Arg Leu Lys Arg
    50                  55                  60

ctc aag gag caa cag agt aag tgt aaa gaa ggc gtc gat ggt tcg aaa     240
Leu Lys Glu Gln Gln Ser Lys Cys Lys Glu Gly Val Asp Gly Ser Lys
65                  70                  75                  80

cag agg cag tcg caa gag caa gct agg agg aag aaa atg tct aga gcc     288
Gln Arg Gln Ser Gln Glu Gln Ala Arg Arg Lys Lys Met Ser Arg Ala
                85                  90                  95

caa gat ggg atc ttg aag tat atg ttg aag atg atg gaa gtt tgt aaa     336
Gln Asp Gly Ile Leu Lys Tyr Met Leu Lys Met Met Glu Val Cys Lys
            100                 105                 110
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gct caa ggc ttt gtt tat ggt att att cct gag aag ggt aag cct gtg      384
Ala Gln Gly Phe Val Tyr Gly Ile Ile Pro Glu Lys Gly Lys Pro Val
        115                 120                 125

act ggt gct tcg gat aat ttg agg gaa tgg tgg aaa gat aag gtt agg      432
Thr Gly Ala Ser Asp Asn Leu Arg Glu Trp Trp Lys Asp Lys Val Arg
    130                 135                 140

ttt gat cgt aat ggt cca gct gct att gct aag tat cag tca gag aat      480
Phe Asp Arg Asn Gly Pro Ala Ala Ile Ala Lys Tyr Gln Ser Glu Asn
145                 150                 155                 160

aat att tct gga ggg agt aat gat tgt aac agc ttg gtt ggt cca aca      528
Asn Ile Ser Gly Gly Ser Asn Asp Cys Asn Ser Leu Val Gly Pro Thr
                165                 170                 175

ccg cat acg ctt cag gag ctt cag gac acg act ctt ggt tcg ctt tta      576
Pro His Thr Leu Gln Glu Leu Gln Asp Thr Thr Leu Gly Ser Leu Leu
            180                 185                 190

tcg gct ttg atg caa cat tgt gat cca ccg cag aga cgg ttt cct ttg      624
Ser Ala Leu Met Gln His Cys Asp Pro Pro Gln Arg Arg Phe Pro Leu
        195                 200                 205

gag aaa gga gtt tct cca cct tgg tgg cct aat ggg aat gaa gag tgg      672
Glu Lys Gly Val Ser Pro Pro Trp Trp Pro Asn Gly Asn Glu Glu Trp
    210                 215                 220

tgg cct cag ctt ggt tta cca aat gag caa ggt cct cct cct tat aag      720
Trp Pro Gln Leu Gly Leu Pro Asn Glu Gln Gly Pro Pro Pro Tyr Lys
225                 230                 235                 240

aag cct cat gat ttg aag aaa gct tgg aaa gtc ggt gtt tta act gcg      768
Lys Pro His Asp Leu Lys Lys Ala Trp Lys Val Gly Val Leu Thr Ala
                245                 250                 255

gtg atc aag cat atg tcg ccg gat att gcg aag atc cgt aag ctt gtg      816
Val Ile Lys His Met Ser Pro Asp Ile Ala Lys Ile Arg Lys Leu Val
            260                 265                 270

agg caa tca aaa tgc ttg cag gat aag atg acg gcg aaa gag agt gct      864
Arg Gln Ser Lys Cys Leu Gln Asp Lys Met Thr Ala Lys Glu Ser Ala
        275                 280                 285

act tgg ctt gcc att att aac caa gaa gag gtt gtg gct cgg gag ctt      912
Thr Trp Leu Ala Ile Ile Asn Gln Glu Glu Val Val Ala Arg Glu Leu
    290                 295                 300

tat ccc gag tca tgc cct cct ctt tct tct tct tca tca tta gga agc      960
Tyr Pro Glu Ser Cys Pro Pro Leu Ser Ser Ser Ser Ser Leu Gly Ser
305                 310                 315                 320

ggg tcg ctt ctc att aat gat tgt agc gag tat gac gtt gaa ggt ttc     1008
Gly Ser Leu Leu Ile Asn Asp Cys Ser Glu Tyr Asp Val Glu Gly Phe
                325                 330                 335

gag aag gaa caa cat ggt ttc gat gtg gaa gag cgg aaa cca gag ata     1056
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Glu Lys Glu Gln His Gly Phe Asp Val Glu Glu Arg Lys Pro Glu Ile
            340                 345                 350

gtg atg atg cat cct cta gca agc ttt ggg gtt gct aaa atg caa cat     1104
Val Met Met His Pro Leu Ala Ser Phe Gly Val Ala Lys Met Gln His
        355                 360                 365

ttt ccc ata aag gag gag gtc gcc acc acg gta aac tta gag ttc acg     1152
Phe Pro Ile Lys Glu Glu Val Ala Thr Thr Val Asn Leu Glu Phe Thr
    370                 375                 380

aga aag agg aag cag aac aat gat atg aat gtt atg gta atg gac aga     1200
Arg Lys Arg Lys Gln Asn Asn Asp Met Asn Val Met Val Met Asp Arg
385                 390                 395                 400

tca gca ggt tac act tgt gag aat ggt cag tgt cct cac agc aaa atg     1248
Ser Ala Gly Tyr Thr Cys Glu Asn Gly Gln Cys Pro His Ser Lys Met
                405                 410                 415

aat ctt gga ttt caa gac agg agt tca agg gac aac cac cag atg gtt     1296
Asn Leu Gly Phe Gln Asp Arg Ser Ser Arg Asp Asn His Gln Met Val
            420                 425                 430

tgt cca tat aga gac aat cgt tta gcg tat gga gca tcc aag ttt cat     1344
Cys Pro Tyr Arg Asp Asn Arg Leu Ala Tyr Gly Ala Ser Lys Phe His
        435                 440                 445

atg ggt gga atg aaa cta gta gtt cct cag caa cca gtc caa ccg atc     1392
Met Gly Gly Met Lys Leu Val Val Pro Gln Gln Pro Val Gln Pro Ile
    450                 455                 460

gac cta tcg ggc gtt gga gtt ccg gaa aac ggg cag aag atg atc acc     1440
Asp Leu Ser Gly Val Gly Val Pro Glu Asn Gly Gln Lys Met Ile Thr
465                 470                 475                 480

gag ctt atg gcc atg tac gac aga aat gtc caa agc aac caa acg cct     1488
Glu Leu Met Ala Met Tyr Asp Arg Asn Val Gln Ser Asn Gln Thr Pro
                485                 490                 495

cct act ttg atg gaa aac caa agc atg gtc att gat gca aaa gca gct     1536
Pro Thr Leu Met Glu Asn Gln Ser Met Val Ile Asp Ala Lys Ala Ala
            500                 505                 510

cag aat cag cag ctg aat ttc aac agt ggc aat caa atg ttt atg caa     1584
Gln Asn Gln Gln Leu Asn Phe Asn Ser Gly Asn Gln Met Phe Met Gln
        515                 520                 525

caa ggg acg aac aac ggg gtt aac aat cgg ttc cag atg gtg ttt gat     1632
Gln Gly Thr Asn Asn Gly Val Asn Asn Arg Phe Gln Met Val Phe Asp
    530                 535                 540

tcg aca cca ttc gat atg gca gca ttc gat tac aga gat gat tgg caa     1680
Ser Thr Pro Phe Asp Met Ala Ala Phe Asp Tyr Arg Asp Asp Trp Gln
545                 550                 555                 560

acc gga gca atg gaa gga atg ggg aag cag cag cag cag cag cag cag     1728
Thr Gly Ala Met Glu Gly Met Gly Lys Gln Gln Gln Gln Gln Gln Gln
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565 570 575

cag caa gat gta tca ata tgg ttc tga 1755
Gln Gln Asp Val Ser Ile Trp Phe
580

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Met Met Met Phe Asn Glu Met Gly Met Tyr Gly Asn Met Asp Phe Phe
1 5 10 15

Ser Ser Ser Thr Ser Leu Asp Val Cys Pro Leu Pro Gln Ala Glu Gln
20 25 30

Glu Pro Val Val Glu Asp Val Asp Tyr Thr Asp Asp Glu Met Asp Val
35 40 45

Asp Glu Leu Glu Lys Arg Met Trp Arg Asp Lys Met Arg Leu Lys Arg
50 55 60

Leu Lys Glu Gln Gln Ser Lys Cys Lys Glu Gly Val Asp Gly Ser Lys
65 70 75 80

Gln Arg Gln Ser Gln Glu Gln Ala Arg Arg Lys Lys Met Ser Arg Ala
85 90 95

Gln Asp Gly Ile Leu Lys Tyr Met Leu Lys Met Met Glu Val Cys Lys
100 105 110

Ala Gln Gly Phe Val Tyr Gly Ile Ile Pro Glu Lys Gly Lys Pro Val
115 120 125

Thr Gly Ala Ser Asp Asn Leu Arg Glu Trp Trp Lys Asp Lys Val Arg
130 135 140

Phe Asp Arg Asn Gly Pro Ala Ala Ile Ala Lys Tyr Gln Ser Glu Asn
145 150 155 160

Asn Ile Ser Gly Gly Ser Asn Asp Cys Asn Ser Leu Val Gly Pro Thr
165 170 175

Pro His Thr Leu Gln Glu Leu Gln Asp Thr Thr Leu Gly Ser Leu Leu
180 185 190

Ser Ala Leu Met Gln His Cys Asp Pro Pro Gln Arg Arg Phe Pro Leu
195 200 205

Glu Lys Gly Val Ser Pro Pro Trp Trp Pro Asn Gly Asn Glu Glu Trp
210 215 220

Trp Pro Gln Leu Gly Leu Pro Asn Glu Gln Gly Pro Pro Pro Tyr Lys
225 230 235 240

Lys Pro His Asp Leu Lys Lys Ala Trp Lys Val Gly Val Leu Thr Ala
245 250 255

Val Ile Lys His Met Ser Pro Asp Ile Ala Lys Ile Arg Lys Leu Val
260 265 270

Arg Gln Ser Lys Cys Leu Gln Asp Lys Met Thr Ala Lys Glu Ser Ala
275 280 285

Thr Trp Leu Ala Ile Ile Asn Gln Glu Glu Val Val Ala Arg Glu Leu
290 295 300

Tyr Pro Glu Ser Cys Pro Pro Leu Ser Ser Ser Ser Ser Leu Gly Ser
305 310 315 320

Gly Ser Leu Leu Ile Asn Asp Cys Ser Glu Tyr Asp Val Glu Gly Phe
325 330 335

Glu Lys Glu Gln His Gly Phe Asp Val Glu Glu Arg Lys Pro Glu Ile
340 345 350

Val Met Met His Pro Leu Ala Ser Phe Gly Val Ala Lys Met Gln His
355 360 365

Phe Pro Ile Lys Glu Glu Val Ala Thr Thr Val Asn Leu Glu Phe Thr
370 375 380

Arg Lys Arg Lys Gln Asn Asn Asp Met Asn Val Met Val Met Asp Arg
385 390 395 400

Ser Ala Gly Tyr Thr Cys Glu Asn Gly Gln Cys Pro His Ser Lys Met
405 410 415

Asn Leu Gly Phe Gln Asp Arg Ser Ser Arg Asp Asn His Gln Met Val

420 425 430

Cys Pro Tyr Arg Asp Asn Arg Leu Ala Tyr Gly Ala Ser Lys Phe His
435 440 445

Met Gly Gly Met Lys Leu Val Val Pro Gln Gln Pro Val Gln Pro Ile
450 455 460

Asp Leu Ser Gly Val Gly Val Pro Glu Asn Gly Gln Lys Met Ile Thr
465 470 475 480

Glu Leu Met Ala Met Tyr Asp Arg Asn Val Gln Ser Asn Gln Thr Pro
485 490 495

Pro Thr Leu Met Glu Asn Gln Ser Met Val Ile Asp Ala Lys Ala Ala
500 505 510

Gln Asn Gln Gln Leu Asn Phe Asn Ser Gly Asn Gln Met Phe Met Gln
515 520 525

Gln Gly Thr Asn Asn Gly Val Asn Asn Arg Phe Gln Met Val Phe Asp
530 535 540

Ser Thr Pro Phe Asp Met Ala Ala Phe Asp Tyr Arg Asp Asp Trp Gln
545 550 555 560

Thr Gly Ala Met Glu Gly Met Gly Lys Gln Gln Gln Gln Gln Gln Gln
565 570 575

Gln Gln Asp Val Ser Ile Trp Phe
580

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tttttcttca tcatttttat tctccttctt cttctgctgt tcatttctcc aggttaca 178

atg atg ttt aat gag atg gga atg tgt gga aac atg gat ttc ttc tct 226
Met Met Phe Asn Glu Met Gly Met Cys Gly Asn Met Asp Phe Phe Ser
1 5 10 15

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tct gga tca ctt ggt gaa gtt gat ttc tgt cct gtt cca caa gct gag      274
Ser Gly Ser Leu Gly Glu Val Asp Phe Cys Pro Val Pro Gln Ala Glu
            20                  25                  30

cct gat tcc att gtt gaa gat gac tat act gat gat gag att gat gtt      322
Pro Asp Ser Ile Val Glu Asp Asp Tyr Thr Asp Asp Glu Ile Asp Val
        35                  40                  45

gat gaa ttg gag agg agg atg tgg aga gac aaa atg cgg ctt aaa cgt      370
Asp Glu Leu Glu Arg Arg Met Trp Arg Asp Lys Met Arg Leu Lys Arg
    50                  55                  60

ctc aag gag cag gat aag ggt aaa gaa ggt gtt gat gct gct aaa cag      418
Leu Lys Glu Gln Asp Lys Gly Lys Glu Gly Val Asp Ala Ala Lys Gln
65                  70                  75                  80

agg cag tct caa gag caa gct agg agg aag aaa atg tct aga gct caa      466
Arg Gln Ser Gln Glu Gln Ala Arg Arg Lys Lys Met Ser Arg Ala Gln
                85                  90                  95

gat ggg atc ttg aag tat atg ttg aag atg atg gaa gtt tgt aaa gct      514
Asp Gly Ile Leu Lys Tyr Met Leu Lys Met Met Glu Val Cys Lys Ala
            100                 105                 110

caa ggc ttt gtt tat ggg att att ccg gag aat ggg aag cct gtg act      562
Gln Gly Phe Val Tyr Gly Ile Ile Pro Glu Asn Gly Lys Pro Val Thr
        115                 120                 125

ggt gct tct gat aat tta agg gag tgg tgg aaa gat aag gtt agg ttt      610
Gly Ala Ser Asp Asn Leu Arg Glu Trp Trp Lys Asp Lys Val Arg Phe
    130                 135                 140

gat cgt aat ggt cct gcg gct att acc aag tat caa gcg gag aat aat      658
Asp Arg Asn Gly Pro Ala Ala Ile Thr Lys Tyr Gln Ala Glu Asn Asn
145                 150                 155                 160

atc ccg ggg att cat gaa ggt aat aac ccg att gga ccg act cct cat      706
Ile Pro Gly Ile His Glu Gly Asn Asn Pro Ile Gly Pro Thr Pro His
                165                 170                 175

acc ttg caa gag ctt caa gac acg act ctt gga tcg ctt ttg tct gcg      754
Thr Leu Gln Glu Leu Gln Asp Thr Thr Leu Gly Ser Leu Leu Ser Ala
            180                 185                 190

ttg atg caa cac tgt gat cct cct cag aga cgt ttt cct ttg gag aaa      802
Leu Met Gln His Cys Asp Pro Pro Gln Arg Arg Phe Pro Leu Glu Lys
        195                 200                 205

gga gtt cct cct ccg tgg tgg cct aat ggg aaa gag gat tgg tgg cct      850
Gly Val Pro Pro Pro Trp Trp Pro Asn Gly Lys Glu Asp Trp Trp Pro
    210                 215                 220

caa ctt ggt ttg cct aaa gat caa ggt cct gca cct tac aag aag cct      898
Gln Leu Gly Leu Pro Lys Asp Gln Gly Pro Ala Pro Tyr Lys Lys Pro
225                 230                 235                 240

cat gat ttg aag aag gcg tgg aaa gtc ggc gtt ttg act gcg gtt atc      946
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His Asp Leu Lys Lys Ala Trp Lys Val Gly Val Leu Thr Ala Val Ile
                245                 250                 255

aag cat atg ttt cct gat att gct aag atc cgt aag ctc gtg agg caa      994
Lys His Met Phe Pro Asp Ile Ala Lys Ile Arg Lys Leu Val Arg Gln
            260                 265                 270

tct aaa tgt ttg cag gat aag atg act gct aaa gag agt gct acc tgg     1042
Ser Lys Cys Leu Gln Asp Lys Met Thr Ala Lys Glu Ser Ala Thr Trp
        275                 280                 285

ctt gct att att aac caa gaa gag tcc ttg gct aga gag ctt tat ccc     1090
Leu Ala Ile Ile Asn Gln Glu Glu Ser Leu Ala Arg Glu Leu Tyr Pro
    290                 295                 300

gag tca tgt cca cct ctt tct ctg tct ggt gga agt tgc tcg ctt ctg     1138
Glu Ser Cys Pro Pro Leu Ser Leu Ser Gly Gly Ser Cys Ser Leu Leu
305                 310                 315                 320

atg aat gat tgc agt caa tac gat gtt gaa ggt ttc gag aag gag tct     1186
Met Asn Asp Cys Ser Gln Tyr Asp Val Glu Gly Phe Glu Lys Glu Ser
                325                 330                 335

cac tat gaa gtg gaa gag ctc aag cca gaa aaa gtt atg aat tct tca     1234
His Tyr Glu Val Glu Glu Leu Lys Pro Glu Lys Val Met Asn Ser Ser
            340                 345                 350

aac ttt ggg atg gtt gct aaa atg cat gac ttt cct gtc aaa gaa gaa     1282
Asn Phe Gly Met Val Ala Lys Met His Asp Phe Pro Val Lys Glu Glu
        355                 360                 365

gtc cca gca gga aac tcg gaa ttc atg aga aag aga aag cca aac aga     1330
Val Pro Ala Gly Asn Ser Glu Phe Met Arg Lys Arg Lys Pro Asn Arg
    370                 375                 380

gat ctg aac act att atg gac aga acc gtt ttc acc tgc gag aat ctt     1378
Asp Leu Asn Thr Ile Met Asp Arg Thr Val Phe Thr Cys Glu Asn Leu
385                 390                 395                 400

ggg tgt gcg cac agc gaa atc agc cgg gga ttt ctg gat agg aat tcg     1426
Gly Cys Ala His Ser Glu Ile Ser Arg Gly Phe Leu Asp Arg Asn Ser
                405                 410                 415

aga gac aac cat caa ctg gca tgt cca cat cga gac agt cgc tta ccg     1474
Arg Asp Asn His Gln Leu Ala Cys Pro His Arg Asp Ser Arg Leu Pro
            420                 425                 430

tat gga gca gca cca tcc agg ttt cat gtc aat gaa gtt aag cct gta     1522
Tyr Gly Ala Ala Pro Ser Arg Phe His Val Asn Glu Val Lys Pro Val
        435                 440                 445

gtt gga ttt cct cag cca agg cca gtg aac tca gta gcc caa cca att     1570
Val Gly Phe Pro Gln Pro Arg Pro Val Asn Ser Val Ala Gln Pro Ile
    450                 455                 460

gac tta acg ggt ata gtt cct gaa gat gga cag aag atg atc tca gag     1618
Asp Leu Thr Gly Ile Val Pro Glu Asp Gly Gln Lys Met Ile Ser Glu
```

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465                 470                 475                 480

ctc atg tcc atg tac gac aga aat gtc cag agc aac caa acc tct atg     1666
Leu Met Ser Met Tyr Asp Arg Asn Val Gln Ser Asn Gln Thr Ser Met
                485                 490                 495

gtc atg gaa aat caa agc gtg tca ctg ctt caa ccc aca gtc cat aac     1714
Val Met Glu Asn Gln Ser Val Ser Leu Leu Gln Pro Thr Val His Asn
            500                 505                 510

cat caa gaa cat ctc cag ttc cca gga aac atg gtg gaa gga agt ttc     1762
His Gln Glu His Leu Gln Phe Pro Gly Asn Met Val Glu Gly Ser Phe
        515                 520                 525

ttt gaa gac ttg aac atc cca aac aga gca aac aac aac aac agc agc     1810
Phe Glu Asp Leu Asn Ile Pro Asn Arg Ala Asn Asn Asn Asn Ser Ser
    530                 535                 540

aac aat caa acg ttt ttt caa ggg aac aac aac aac aac aat gtg ttt     1858
Asn Asn Gln Thr Phe Phe Gln Gly Asn Asn Asn Asn Asn Asn Val Phe
545                 550                 555                 560

aag ttc gac act gca gat cac aac aac ttt gaa gct gca cat aac aac     1906
Lys Phe Asp Thr Ala Asp His Asn Asn Phe Glu Ala Ala His Asn Asn
                565                 570                 575

aac aat aac agt agc ggc aac agg ttc cag ctt gtg ttt gat tcc aca     1954
Asn Asn Asn Ser Ser Gly Asn Arg Phe Gln Leu Val Phe Asp Ser Thr
            580                 585                 590

ccg ttc gac atg gcg tca ttc gat tac aga gat gat atg tcg atg cca     2002
Pro Phe Asp Met Ala Ser Phe Asp Tyr Arg Asp Asp Met Ser Met Pro
        595                 600                 605

gga gta gta gga acg atg gat gga atg cag cag aag cag caa gat gta     2050
Gly Val Val Gly Thr Met Asp Gly Met Gln Gln Lys Gln Gln Asp Val
    610                 615                 620

tcc ata tgg ttc taa agtcttggta gtagatttca tcttctctta tttttatctt     2105
Ser Ile Trp Phe
625

ttgtgttctt acattcactc aaccatgtaa tatttttttcc tgggtctctc tgtctctatc   2165

gcttgttatg atgtgtctgt aagagtctct aaaaactctc tgttactgtg tgtctttgtc   2225

tcggcttggt gaatctctct gtcatcatca gcttttagtt acacacccga cttggggatg   2285

aacgaacact aaatgtaagt tttca                                         2310


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Met Met Phe Asn Glu Met Gly Met Cys Gly Asn Met Asp Phe Phe Ser
1               5                   10                  15
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Ser Gly Ser Leu Gly Glu Val Asp Phe Cys Pro Val Pro Gln Ala Glu
20 25 30

Pro Asp Ser Ile Val Glu Asp Asp Tyr Thr Asp Asp Glu Ile Asp Val
35 40 45

Asp Glu Leu Glu Arg Arg Met Trp Arg Asp Lys Met Arg Leu Lys Arg
50 55 60

Leu Lys Glu Gln Asp Lys Gly Lys Glu Gly Val Asp Ala Ala Lys Gln
65 70 75 80

Arg Gln Ser Gln Glu Gln Ala Arg Arg Lys Lys Met Ser Arg Ala Gln
85 90 95

Asp Gly Ile Leu Lys Tyr Met Leu Lys Met Met Glu Val Cys Lys Ala
100 105 110

Gln Gly Phe Val Tyr Gly Ile Ile Pro Glu Asn Gly Lys Pro Val Thr
115 120 125

Gly Ala Ser Asp Asn Leu Arg Glu Trp Trp Lys Asp Lys Val Arg Phe
130 135 140

Asp Arg Asn Gly Pro Ala Ala Ile Thr Lys Tyr Gln Ala Glu Asn Asn
145 150 155 160

Ile Pro Gly Ile His Glu Gly Asn Asn Pro Ile Gly Pro Thr Pro His
165 170 175

Thr Leu Gln Glu Leu Gln Asp Thr Thr Leu Gly Ser Leu Leu Ser Ala
180 185 190

Leu Met Gln His Cys Asp Pro Pro Gln Arg Arg Phe Pro Leu Glu Lys
195 200 205

Gly Val Pro Pro Pro Trp Trp Pro Asn Gly Lys Glu Asp Trp Trp Pro
210 215 220

Gln Leu Gly Leu Pro Lys Asp Gln Gly Pro Ala Pro Tyr Lys Lys Pro
225 230 235 240

His Asp Leu Lys Lys Ala Trp Lys Val Gly Val Leu Thr Ala Val Ile

245 250 255

Lys His Met Phe Pro Asp Ile Ala Lys Ile Arg Lys Leu Val Arg Gln
260 265 270

Ser Lys Cys Leu Gln Asp Lys Met Thr Ala Lys Glu Ser Ala Thr Trp
275 280 285

Leu Ala Ile Ile Asn Gln Glu Glu Ser Leu Ala Arg Glu Leu Tyr Pro
290 295 300

Glu Ser Cys Pro Pro Leu Ser Leu Ser Gly Gly Ser Cys Ser Leu Leu
305 310 315 320

Met Asn Asp Cys Ser Gln Tyr Asp Val Glu Gly Phe Glu Lys Glu Ser
325 330 335

His Tyr Glu Val Glu Glu Leu Lys Pro Glu Lys Val Met Asn Ser Ser
340 345 350

Asn Phe Gly Met Val Ala Lys Met His Asp Phe Pro Val Lys Glu Glu
355 360 365

Val Pro Ala Gly Asn Ser Glu Phe Met Arg Lys Arg Lys Pro Asn Arg
370 375 380

Asp Leu Asn Thr Ile Met Asp Arg Thr Val Phe Thr Cys Glu Asn Leu
385 390 395 400

Gly Cys Ala His Ser Glu Ile Ser Arg Gly Phe Leu Asp Arg Asn Ser
405 410 415

Arg Asp Asn His Gln Leu Ala Cys Pro His Arg Asp Ser Arg Leu Pro
420 425 430

Tyr Gly Ala Ala Pro Ser Arg Phe His Val Asn Glu Val Lys Pro Val
435 440 445

Val Gly Phe Pro Gln Pro Arg Pro Val Asn Ser Val Ala Gln Pro Ile
450 455 460

Asp Leu Thr Gly Ile Val Pro Glu Asp Gly Gln Lys Met Ile Ser Glu
465 470 475 480

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Leu Met Ser Met Tyr Asp Arg Asn Val Gln Ser Asn Gln Thr Ser Met
                485                 490                 495

Val Met Glu Asn Gln Ser Val Ser Leu Leu Gln Pro Thr Val His Asn
            500                 505                 510

His Gln Glu His Leu Gln Phe Pro Gly Asn Met Val Glu Gly Ser Phe
        515                 520                 525

Phe Glu Asp Leu Asn Ile Pro Asn Arg Ala Asn Asn Asn Asn Ser Ser
    530                 535                 540

Asn Asn Gln Thr Phe Phe Gln Gly Asn Asn Asn Asn Asn Asn Val Phe
545                 550                 555                 560

Lys Phe Asp Thr Ala Asp His Asn Asn Phe Glu Ala Ala His Asn Asn
                565                 570                 575

Asn Asn Asn Ser Ser Gly Asn Arg Phe Gln Leu Val Phe Asp Ser Thr
            580                 585                 590

Pro Phe Asp Met Ala Ser Phe Asp Tyr Arg Asp Asp Met Ser Met Pro
        595                 600                 605

Gly Val Val Gly Thr Met Asp Gly Met Gln Gln Lys Gln Gln Asp Val
    610                 615                 620

Ser Ile Trp Phe
625
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<222> (69)..(815) <223> G976

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cttatatata acaaataaac acataagttg acatatatac tatatacaag tatattaatt     60

atacatat atg gct gac cct aac aat cct atc act gaa cct aaa gct ata     110
         Met Ala Asp Pro Asn Asn Pro Ile Thr Glu Pro Lys Ala Ile
         1               5                   10

atc caa tct tct act tca tcg tca gtt act att gtg cca gtt ccc acg      158
Ile Gln Ser Ser Thr Ser Ser Ser Val Thr Ile Val Pro Val Pro Thr
15                  20                  25                  30

tgc ggt gac agc ctc tct gac tct gcc acg tgt gaa aac cct tgt cca      206
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Cys Gly Asp Ser Leu Ser Asp Ser Ala Thr Cys Glu Asn Pro Cys Pro
                35                  40                  45

ctt gat act atc act act act act act act gtt tgt ttt gcg gct cct      254
Leu Asp Thr Ile Thr Thr Thr Thr Thr Thr Val Cys Phe Ala Ala Pro
            50                  55                  60

tct tct act gca agt ggt aat gat att aat act tta atg gcc act gac      302
Ser Ser Thr Ala Ser Gly Asn Asp Ile Asn Thr Leu Met Ala Thr Asp
        65                  70                  75

acc gac atc tct cgc cgg aaa aag aat ccg gtt tat cgg gga att cgt      350
Thr Asp Ile Ser Arg Arg Lys Lys Asn Pro Val Tyr Arg Gly Ile Arg
    80                  85                  90

tgt cgg agt gga aaa tgg gtg tct gaa atc cga gag cct aaa aag act      398
Cys Arg Ser Gly Lys Trp Val Ser Glu Ile Arg Glu Pro Lys Lys Thr
95                  100                 105                 110

aca cgt gtc tgg ctt ggg act tat ccg acg ccg gag atg gct gct gcc      446
Thr Arg Val Trp Leu Gly Thr Tyr Pro Thr Pro Glu Met Ala Ala Ala
                115                 120                 125

gca tat gac gtg gcg gcg tta gct ctt aaa ggt gga gac act ctc ttg      494
Ala Tyr Asp Val Ala Ala Leu Ala Leu Lys Gly Gly Asp Thr Leu Leu
            130                 135                 140

aac ttc ccg gat tcc ctg gga tct tac ccc att ccc ctt tcc tct tcc      542
Asn Phe Pro Asp Ser Leu Gly Ser Tyr Pro Ile Pro Leu Ser Ser Ser
        145                 150                 155

gca gct cat atc aga tgc gct gca gct gcg gct gct gcg act agg ggt      590
Ala Ala His Ile Arg Cys Ala Ala Ala Ala Ala Ala Ala Thr Arg Gly
    160                 165                 170

gcg gct gga gcg gcc gtg aag gta ggt caa aag aag gaa gat aaa gtt      638
Ala Ala Gly Ala Ala Val Lys Val Gly Gln Lys Lys Glu Asp Lys Val
175                 180                 185                 190

tat gat acg gcg gaa tct tca act atg ggg ttt gtg gat gaa gaa gag      686
Tyr Asp Thr Ala Glu Ser Ser Thr Met Gly Phe Val Asp Glu Glu Glu
                195                 200                 205

cta ttg aac atg cct ggt ttg cta gcg gat atg gcc aaa ggg atg atg      734
Leu Leu Asn Met Pro Gly Leu Leu Ala Asp Met Ala Lys Gly Met Met
            210                 215                 220

gtg gct cca ccg tgg atg gga tct cca ccg tca gat gat tcg cca gag      782
Val Ala Pro Pro Trp Met Gly Ser Pro Pro Ser Asp Asp Ser Pro Glu
        225                 230                 235

aat tct gat gga gag agc ttg tgg agc tat tga tcgattgaaa gcagtttaat    835
Asn Ser Asp Gly Glu Ser Leu Trp Ser Tyr
    240                 245

atctttttg gatcctttgt tcacgtttat gctagtcatc tttgtttctt tatcctatga    895
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ttgttagaga tgatttgtta aatatataat cgtaatgatt ttcacttttt tttattcaaa 955

aaaaaaaa 963

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Met Ala Asp Pro Asn Asn Pro Ile Thr Glu Pro Lys Ala Ile Ile Gln
1 5 10 15

Ser Ser Thr Ser Ser Ser Val Thr Ile Val Pro Val Pro Thr Cys Gly
20 25 30

Asp Ser Leu Ser Asp Ser Ala Thr Cys Glu Asn Pro Cys Pro Leu Asp
35 40 45

Thr Ile Thr Thr Thr Thr Thr Thr Val Cys Phe Ala Ala Pro Ser Ser
50 55 60

Thr Ala Ser Gly Asn Asp Ile Asn Thr Leu Met Ala Thr Asp Thr Asp
65 70 75 80

Ile Ser Arg Arg Lys Lys Asn Pro Val Tyr Arg Gly Ile Arg Cys Arg
85 90 95

Ser Gly Lys Trp Val Ser Glu Ile Arg Glu Pro Lys Lys Thr Thr Arg
100 105 110

Val Trp Leu Gly Thr Tyr Pro Thr Pro Glu Met Ala Ala Ala Ala Tyr
115 120 125

Asp Val Ala Ala Leu Ala Leu Lys Gly Gly Asp Thr Leu Leu Asn Phe
130 135 140

Pro Asp Ser Leu Gly Ser Tyr Pro Ile Pro Leu Ser Ser Ser Ala Ala
145 150 155 160

His Ile Arg Cys Ala Ala Ala Ala Ala Ala Ala Thr Arg Gly Ala Ala
165 170 175

Gly Ala Ala Val Lys Val Gly Gln Lys Lys Glu Asp Lys Val Tyr Asp
180 185 190

Thr Ala Glu Ser Ser Thr Met Gly Phe Val Asp Glu Glu Glu Leu Leu
195 200 205

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Asn Met Pro Gly Leu Leu Ala Asp Met Ala Lys Gly Met Met Val Ala
    210                 215                 220

Pro Pro Trp Met Gly Ser Pro Pro Ser Asp Asp Ser Pro Glu Asn Ser
225                 230                 235                 240

Asp Gly Glu Ser Leu Trp Ser Tyr
                245
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caaat atg gaa tac agc tgt gta gac gac agt agt aca acg tca gaa tct     50
      Met Glu Tyr Ser Cys Val Asp Asp Ser Ser Thr Thr Ser Glu Ser
      1               5                   10                  15

ctc tcc atc tct act act cca aag ccg aca acg acg acg gag aag aaa       98
Leu Ser Ile Ser Thr Thr Pro Lys Pro Thr Thr Thr Thr Glu Lys Lys
                20                  25                  30

ctc tct tct ccg ccg gcg acg tcg atg cgt ctc tac aga atg gga agc      146
Leu Ser Ser Pro Pro Ala Thr Ser Met Arg Leu Tyr Arg Met Gly Ser
            35                  40                  45

ggc gga agc agc gtc gtt ttg gat tca gag aac ggc gtc gag acc gag      194
Gly Gly Ser Ser Val Val Leu Asp Ser Glu Asn Gly Val Glu Thr Glu
        50                  55                  60

tca cgt aag ctt cct tcg tcg aaa tat aaa ggc gtt gtg cct cag cct      242
Ser Arg Lys Leu Pro Ser Ser Lys Tyr Lys Gly Val Val Pro Gln Pro
    65                  70                  75

aac gga aga tgg gga gct cag att tac gag aag cat cag cga gtt tgg      290
Asn Gly Arg Trp Gly Ala Gln Ile Tyr Glu Lys His Gln Arg Val Trp
80                  85                  90                  95

ctc ggt act ttc aac gag gaa gaa gaa gct gcg tct tct tac gac atc      338
Leu Gly Thr Phe Asn Glu Glu Glu Glu Ala Ala Ser Ser Tyr Asp Ile
                100                 105                 110

gcc gtg agg aga ttc cgc ggc cgc gac gcc gtc act aac ttc aaa tct      386
Ala Val Arg Arg Phe Arg Gly Arg Asp Ala Val Thr Asn Phe Lys Ser
            115                 120                 125

caa gtt gat gga aac gac gcc gaa tcg gct ttt ctt gac gct cat tct      434
Gln Val Asp Gly Asn Asp Ala Glu Ser Ala Phe Leu Asp Ala His Ser
        130                 135                 140

aaa gct gag atc gtg gat atg ttg agg aaa cac act tac gcc gat gag      482
Lys Ala Glu Ile Val Asp Met Leu Arg Lys His Thr Tyr Ala Asp Glu
    145                 150                 155
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ttt gag cag agt aga cgg aag ttt gtt aac ggc gac gga aaa cgc tct      530
Phe Glu Gln Ser Arg Arg Lys Phe Val Asn Gly Asp Gly Lys Arg Ser
160                 165                 170                 175

ggg ttg gag acg gcg acg tac gga aac gac gct gtt ttg aga gcg cgt      578
Gly Leu Glu Thr Ala Thr Tyr Gly Asn Asp Ala Val Leu Arg Ala Arg
                180                 185                 190

gag gtt ttg ttc gag aag act gtt acg ccg agc gac gtc ggg aag ctg      626
Glu Val Leu Phe Glu Lys Thr Val Thr Pro Ser Asp Val Gly Lys Leu
            195                 200                 205

aac cgt tta gtg ata ccg aaa caa cac gcg gag aag cat ttt ccg tta      674
Asn Arg Leu Val Ile Pro Lys Gln His Ala Glu Lys His Phe Pro Leu
        210                 215                 220

ccg gcg atg acg acg gcg atg ggg atg aat ccg tct ccg acg aaa ggc      722
Pro Ala Met Thr Thr Ala Met Gly Met Asn Pro Ser Pro Thr Lys Gly
    225                 230                 235

gtt ttg att aac ttg gaa gat aga aca ggg aaa gtg tgg cgg ttc cgt      770
Val Leu Ile Asn Leu Glu Asp Arg Thr Gly Lys Val Trp Arg Phe Arg
240                 245                 250                 255

tac agt tac tgg aac agc agt caa agt tac gtg ttg acc aag ggc tgg      818
Tyr Ser Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys Gly Trp
                260                 265                 270

agc cgg ttc gtt aaa gag aag aat ctt cga gcc ggt gat gtg gtt tgt      866
Ser Arg Phe Val Lys Glu Lys Asn Leu Arg Ala Gly Asp Val Val Cys
            275                 280                 285

ttc gag aga tca acc gga cca gac cgg caa ttg tat atc cac tgg aaa      914
Phe Glu Arg Ser Thr Gly Pro Asp Arg Gln Leu Tyr Ile His Trp Lys
        290                 295                 300

gtc cgg tct agt ccg gtt cag act gtg gtt agg cta ttc gga gtc aac      962
Val Arg Ser Ser Pro Val Gln Thr Val Val Arg Leu Phe Gly Val Asn
    305                 310                 315

att ttc aat gtg agt aac gag aaa cca aac gac gtc gca gta gag tgt     1010
Ile Phe Asn Val Ser Asn Glu Lys Pro Asn Asp Val Ala Val Glu Cys
320                 325                 330                 335

gtt ggc aag aag aga tct cgg gaa gat gat ttg ttt tcg tta ggg tgt     1058
Val Gly Lys Lys Arg Ser Arg Glu Asp Asp Leu Phe Ser Leu Gly Cys
                340                 345                 350

tcc aag aag cag gcg att atc aac atc ttg tga caaattcttt ttttttggtt    1111
Ser Lys Lys Gln Ala Ile Ile Asn Ile Leu
            355                 360

tttttcttca atttgtttct ccttttttcaa tattttgtat tgaaatgaca agttgtaaat   1171

taggacaaga caagaaaaaa tgacaactag acaaaatagt ttttgtttaa aaaaaaaaaa    1231
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aaaaaaaa 1239

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Ser Ile Ser Thr Thr Pro Lys Pro Thr Thr Thr Thr Glu Lys Lys Leu
20 25 30

Ser Ser Pro Pro Ala Thr Ser Met Arg Leu Tyr Arg Met Gly Ser Gly
35 40 45

Gly Ser Ser Val Val Leu Asp Ser Glu Asn Gly Val Glu Thr Glu Ser
50 55 60

Arg Lys Leu Pro Ser Ser Lys Tyr Lys Gly Val Val Pro Gln Pro Asn
65 70 75 80

Gly Arg Trp Gly Ala Gln Ile Tyr Glu Lys His Gln Arg Val Trp Leu
85 90 95

Gly Thr Phe Asn Glu Glu Glu Glu Ala Ala Ser Ser Tyr Asp Ile Ala
100 105 110

Val Arg Arg Phe Arg Gly Arg Asp Ala Val Thr Asn Phe Lys Ser Gln
115 120 125

Val Asp Gly Asn Asp Ala Glu Ser Ala Phe Leu Asp Ala His Ser Lys
130 135 140

Ala Glu Ile Val Asp Met Leu Arg Lys His Thr Tyr Ala Asp Glu Phe
145 150 155 160

Glu Gln Ser Arg Arg Lys Phe Val Asn Gly Asp Gly Lys Arg Ser Gly
165 170 175

Leu Glu Thr Ala Thr Tyr Gly Asn Asp Ala Val Leu Arg Ala Arg Glu
180 185 190

Val Leu Phe Glu Lys Thr Val Thr Pro Ser Asp Val Gly Lys Leu Asn
195 200 205

Arg Leu Val Ile Pro Lys Gln His Ala Glu Lys His Phe Pro Leu Pro
210 215 220

Ala Met Thr Thr Ala Met Gly Met Asn Pro Ser Pro Thr Lys Gly Val
225 230 235 240

Leu Ile Asn Leu Glu Asp Arg Thr Gly Lys Val Trp Arg Phe Arg Tyr
245 250 255

Ser Tyr Trp Asn Ser Ser Gln Ser Tyr Val Leu Thr Lys Gly Trp Ser
260 265 270

Arg Phe Val Lys Glu Lys Asn Leu Arg Ala Gly Asp Val Val Cys Phe
275 280 285

Glu Arg Ser Thr Gly Pro Asp Arg Gln Leu Tyr Ile His Trp Lys Val
290 295 300

Arg Ser Ser Pro Val Gln Thr Val Val Arg Leu Phe Gly Val Asn Ile
305 310 315 320

Phe Asn Val Ser Asn Glu Lys Pro Asn Asp Val Ala Val Glu Cys Val
325 330 335

Gly Lys Lys Arg Ser Arg Glu Asp Asp Leu Phe Ser Leu Gly Cys Ser
340 345 350

Lys Lys Gln Ala Ile Ile Asn Ile Leu
355 360

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<222> (52)..(783) <223> G1006

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Met Tyr
1

gga cag tgc aat ata gaa tcc gac tac gct ttg ttg gag tcg ata aca 105
Gly Gln Cys Asn Ile Glu Ser Asp Tyr Ala Leu Leu Glu Ser Ile Thr
5 10 15

cgt cac ttg cta gga gga gga gga gag aac gag ctg cga ctc aat gag 153
Arg His Leu Leu Gly Gly Gly Gly Glu Asn Glu Leu Arg Leu Asn Glu
20 25 30

tca aca ccg agt tcg tgt ttc aca gag agt tgg gga ggt ttg cca ttg 201

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Ser Thr Pro Ser Ser Cys Phe Thr Glu Ser Trp Gly Gly Leu Pro Leu
35                  40                  45                  50

aaa gag aat gat tca gag gac atg ttg gtg tac gga ctc ctc aaa gat      249
Lys Glu Asn Asp Ser Glu Asp Met Leu Val Tyr Gly Leu Leu Lys Asp
                55                  60                  65

gcc ttc cat ttt gac acg tca tca tcg gac ttg agc tgt ctt ttt gat      297
Ala Phe His Phe Asp Thr Ser Ser Ser Asp Leu Ser Cys Leu Phe Asp
            70                  75                  80

ttt ccg gcg gtt aaa gtc gag cca act gag aac ttt acg gcg atg gag      345
Phe Pro Ala Val Lys Val Glu Pro Thr Glu Asn Phe Thr Ala Met Glu
        85                  90                  95

gag aaa cca aag aaa gcg ata ccg gtt acg gag acg gca gtg aag gcg      393
Glu Lys Pro Lys Lys Ala Ile Pro Val Thr Glu Thr Ala Val Lys Ala
    100                 105                 110

aag cat tac aga gga gtg agg cag aga ccg tgg ggg aaa ttc gcg gcg      441
Lys His Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Phe Ala Ala
115                 120                 125                 130

gag ata cgt gat ccg gcg aag aat gga gct agg gtt tgg tta ggg acg      489
Glu Ile Arg Asp Pro Ala Lys Asn Gly Ala Arg Val Trp Leu Gly Thr
                135                 140                 145

ttt gag acg gcg gaa gat gcg gct tta gct tac gat ata gct gct ttt      537
Phe Glu Thr Ala Glu Asp Ala Ala Leu Ala Tyr Asp Ile Ala Ala Phe
            150                 155                 160

agg atg cgt ggt tcc cgc gct tta ttg aat ttt ccg ttg agg gtt aat      585
Arg Met Arg Gly Ser Arg Ala Leu Leu Asn Phe Pro Leu Arg Val Asn
        165                 170                 175

tcc ggt gaa cct gac ccg gtt cgg atc acg tct aag aga tct tct tcg      633
Ser Gly Glu Pro Asp Pro Val Arg Ile Thr Ser Lys Arg Ser Ser Ser
    180                 185                 190

tcg tcg tcg tcg tcg tcc tct tct acg tcg tcg tct gaa aac ggg aag      681
Ser Ser Ser Ser Ser Ser Ser Ser Thr Ser Ser Ser Glu Asn Gly Lys
195                 200                 205                 210

ttg aaa cga agg aga aaa gca gag aat ctg acg tcg gag gtg gtg cag      729
Leu Lys Arg Arg Arg Lys Ala Glu Asn Leu Thr Ser Glu Val Val Gln
                215                 220                 225

gtg aag tgt gag gtt ggt gat gag aca cgt gtt gat gag tta ttg gtt      777
Val Lys Cys Glu Val Gly Asp Glu Thr Arg Val Asp Glu Leu Leu Val
            230                 235                 240

tca taa gtttgatctt gtgtgttttg tagttgaata gttttgctat aaatgttgag      833
Ser

gcaccaagta aaagtgttcc cgtgatgtaa attagttact aaacagagcc atatatcttc    893
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aatcaaaaaa aaaaaaaaaa 913

<210> 416 <211> 243 <212> PRT <213> Arabidopsis thaliana <400> 416

Met Tyr Gly Gln Cys Asn Ile Glu Ser Asp Tyr Ala Leu Leu Glu Ser
1 5 10 15

Ile Thr Arg His Leu Leu Gly Gly Gly Gly Glu Asn Glu Leu Arg Leu
20 25 30

Asn Glu Ser Thr Pro Ser Ser Cys Phe Thr Glu Ser Trp Gly Gly Leu
35 40 45

Pro Leu Lys Glu Asn Asp Ser Glu Asp Met Leu Val Tyr Gly Leu Leu
50 55 60

Lys Asp Ala Phe His Phe Asp Thr Ser Ser Ser Asp Leu Ser Cys Leu
65 70 75 80

Phe Asp Phe Pro Ala Val Lys Val Glu Pro Thr Glu Asn Phe Thr Ala
85 90 95

Met Glu Glu Lys Pro Lys Lys Ala Ile Pro Val Thr Glu Thr Ala Val
100 105 110

Lys Ala Lys His Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Phe
115 120 125

Ala Ala Glu Ile Arg Asp Pro Ala Lys Asn Gly Ala Arg Val Trp Leu
130 135 140

Gly Thr Phe Glu Thr Ala Glu Asp Ala Ala Leu Ala Tyr Asp Ile Ala
145 150 155 160

Ala Phe Arg Met Arg Gly Ser Arg Ala Leu Leu Asn Phe Pro Leu Arg
165 170 175

Val Asn Ser Gly Glu Pro Asp Pro Val Arg Ile Thr Ser Lys Arg Ser
180 185 190

Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Ser Thr Ser Ser Ser Glu Asn
195 200 205

```
Gly Lys Leu Lys Arg Arg Arg Lys Ala Glu Asn Leu Thr Ser Glu Val
    210                 215                 220

Val Gln Val Lys Cys Glu Val Gly Asp Glu Thr Arg Val Asp Glu Leu
225                 230                 235                 240

Leu Val Ser
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<210> 417 <211> 1291 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (66)..(1031) <223> G1051

<400> 417

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cctgtaaatt cagatttgct ttctttggta atcttttgga tcaagatcca tctatttttt     60

cttca atg gca caa ctc cct cct aaa atc ccc aac atg aca caa cat tgg    110
      Met Ala Gln Leu Pro Pro Lys Ile Pro Asn Met Thr Gln His Trp
      1               5                   10                  15

cct gat ttc tct tcc caa aag ctc tct cct ttc tct acc cca acc gca      158
Pro Asp Phe Ser Ser Gln Lys Leu Ser Pro Phe Ser Thr Pro Thr Ala
                20                  25                  30

acc gct gtc gcc acc gct aca acc acc gta caa aac ccc tca tgg gtc      206
Thr Ala Val Ala Thr Ala Thr Thr Thr Val Gln Asn Pro Ser Trp Val
            35                  40                  45

gac gaa ttc ctc gac ttc tca gcg tct cgc cgt ggc aac cac cgt cgt      254
Asp Glu Phe Leu Asp Phe Ser Ala Ser Arg Arg Gly Asn His Arg Arg
        50                  55                  60

tcc atc agc gac tct atc gca ttc ctc gaa gct cca aca gtc agc atc      302
Ser Ile Ser Asp Ser Ile Ala Phe Leu Glu Ala Pro Thr Val Ser Ile
    65                  70                  75

gaa gac cac caa ttc gac agg ttc gat gac gaa cag ttc atg tcg atg      350
Glu Asp His Gln Phe Asp Arg Phe Asp Asp Glu Gln Phe Met Ser Met
80                  85                  90                  95

ttc acc gac gac gac aac ctt cat agc aat cct tcc cat atc aac aac      398
Phe Thr Asp Asp Asp Asn Leu His Ser Asn Pro Ser His Ile Asn Asn
                100                 105                 110

aaa aat aac aat gtg ggg ccc acg gga tct tcc tcg aac aca tcc acg      446
Lys Asn Asn Asn Val Gly Pro Thr Gly Ser Ser Ser Asn Thr Ser Thr
            115                 120                 125

ccg tcc aat agc ttc aac gac gat aac aaa gaa tta cca ccg tcc gat      494
Pro Ser Asn Ser Phe Asn Asp Asp Asn Lys Glu Leu Pro Pro Ser Asp
        130                 135                 140

cat aac atg aac aat aat atc aac aac aac tat aac gat gaa gtc caa      542
His Asn Met Asn Asn Asn Ile Asn Asn Asn Tyr Asn Asp Glu Val Gln
    145                 150                 155
```

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agc caa tgc aag atg gag cca gaa gat ggt acg gcg tcg aat aac aat      590
Ser Gln Cys Lys Met Glu Pro Glu Asp Gly Thr Ala Ser Asn Asn Asn
160                 165                 170                 175

tcc ggt gat agc tcc ggc aac cgg att ctc gat ccc aaa agg gtt aag      638
Ser Gly Asp Ser Ser Gly Asn Arg Ile Leu Asp Pro Lys Arg Val Lys
                180                 185                 190

aga ata tta gca aat cgg caa tca gca cag aga tca agg gtg agg aaa      686
Arg Ile Leu Ala Asn Arg Gln Ser Ala Gln Arg Ser Arg Val Arg Lys
            195                 200                 205

ctg caa tac ata tca gag ctc gaa cgt agc gtc act tcg ttg cag gcg      734
Leu Gln Tyr Ile Ser Glu Leu Glu Arg Ser Val Thr Ser Leu Gln Ala
        210                 215                 220

gaa gtg tca gtg tta tcg cca aga gtt gca ttc ttg gat cat caa cgt      782
Glu Val Ser Val Leu Ser Pro Arg Val Ala Phe Leu Asp His Gln Arg
    225                 230                 235

ttg ctt ctt aac gtt gac aac agc gct ctc aag caa cga atc gct gct      830
Leu Leu Leu Asn Val Asp Asn Ser Ala Leu Lys Gln Arg Ile Ala Ala
240                 245                 250                 255

tta tct caa gac aag ctt ttc aaa gac gca cat caa gaa gca ttg aag      878
Leu Ser Gln Asp Lys Leu Phe Lys Asp Ala His Gln Glu Ala Leu Lys
                260                 265                 270

aga gaa ata gag aga ctt cga caa gtg tat aat caa caa agc ctc acg      926
Arg Glu Ile Glu Arg Leu Arg Gln Val Tyr Asn Gln Gln Ser Leu Thr
            275                 280                 285

aat gtg gaa aat gca aat cat tta tcg gcg acc gga gcc ggt gct act      974
Asn Val Glu Asn Ala Asn His Leu Ser Ala Thr Gly Ala Gly Ala Thr
        290                 295                 300

ccg gcc gtc gac atc aag tcg tcc gtt gaa aca gag cag ctc ctc aat     1022
Pro Ala Val Asp Ile Lys Ser Ser Val Glu Thr Glu Gln Leu Leu Asn
    305                 310                 315

gtc tca taa attaaccatc atgcatcatc atcaacattt ctctctttta            1071
Val Ser
320

gcttcttggc aaaagttctt gactataaaa tctctttcgg gtaagaaatt caggagatat   1131

acatttttta ttctaatcac attgttttta agttgtgatg aattcagttt gatgtatctt   1191

atttattttg tttatgtcgt ctttttttct tggggttgat ggaagggaat catcaattgt   1251

tgtttgtaca aagaactagt tgaatttttt ttttttttt                          1291
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<210> 418 <211> 321 <212> PRT <213> Arabidopsis thaliana <400> 418

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Met Ala Gln Leu Pro Pro Lys Ile Pro Asn Met Thr Gln His Trp Pro
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Sequence Listing

1 5 10 15

Asp Phe Ser Ser Gln Lys Leu Ser Pro Phe Ser Thr Pro Thr Ala Thr
20 25 30

Ala Val Ala Thr Ala Thr Thr Thr Val Gln Asn Pro Ser Trp Val Asp
35 40 45

Glu Phe Leu Asp Phe Ser Ala Ser Arg Arg Gly Asn His Arg Arg Ser
50 55 60

Ile Ser Asp Ser Ile Ala Phe Leu Glu Ala Pro Thr Val Ser Ile Glu
65 70 75 80

Asp His Gln Phe Asp Arg Phe Asp Asp Glu Gln Phe Met Ser Met Phe
85 90 95

Thr Asp Asp Asp Asn Leu His Ser Asn Pro Ser His Ile Asn Asn Lys
100 105 110

Asn Asn Asn Val Gly Pro Thr Gly Ser Ser Ser Asn Thr Ser Thr Pro
115 120 125

Ser Asn Ser Phe Asn Asp Asp Asn Lys Glu Leu Pro Pro Ser Asp His
130 135 140

Asn Met Asn Asn Asn Ile Asn Asn Asn Tyr Asn Asp Glu Val Gln Ser
145 150 155 160

Gln Cys Lys Met Glu Pro Glu Asp Gly Thr Ala Ser Asn Asn Asn Ser
165 170 175

Gly Asp Ser Ser Gly Asn Arg Ile Leu Asp Pro Lys Arg Val Lys Arg
180 185 190

Ile Leu Ala Asn Arg Gln Ser Ala Gln Arg Ser Arg Val Arg Lys Leu
195 200 205

Gln Tyr Ile Ser Glu Leu Glu Arg Ser Val Thr Ser Leu Gln Ala Glu
210 215 220

Val Ser Val Leu Ser Pro Arg Val Ala Phe Leu Asp His Gln Arg Leu
225 230 235 240

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```
Leu Leu Asn Val Asp Asn Ser Ala Leu Lys Gln Arg Ile Ala Ala Leu
                245                 250                 255

Ser Gln Asp Lys Leu Phe Lys Asp Ala His Gln Glu Ala Leu Lys Arg
            260                 265                 270

Glu Ile Glu Arg Leu Arg Gln Val Tyr Asn Gln Gln Ser Leu Thr Asn
        275                 280                 285

Val Glu Asn Ala Asn His Leu Ser Ala Thr Gly Ala Gly Ala Thr Pro
    290                 295                 300

Ala Val Asp Ile Lys Ser Ser Val Glu Thr Glu Gln Leu Leu Asn Val
305                 310                 315                 320

Ser
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<210> 419 <211> 1342 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (198)..(1076) <223> G1076

<400> 419

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attttagtct tcctataact tcttctcaat cctctctcat atctttttc ttagtttaaa     60

tttcaataaa atagaaaaaa acatatacaa atctacagag aagagaagct ttattttaat    120

cttgtgtgtg tgtgtgtgtt ttatataatt tttatttttt ttcaaattaa aatctcttct    180

ttgcttttga tgtgggc atg gct ggt ctt gat cta ggc aca gct ttt cgt       230
                  Met Ala Gly Leu Asp Leu Gly Thr Ala Phe Arg
                  1               5                   10

tac gtt aat cac cag ctc cat cgt ccc gat ctc cac ctt cac cac aat      278
Tyr Val Asn His Gln Leu His Arg Pro Asp Leu His Leu His His Asn
            15                  20                  25

tcc tcc tcc gat gac gtc act ccc gga gcc ggg atg ggt cat ttc acc      326
Ser Ser Ser Asp Asp Val Thr Pro Gly Ala Gly Met Gly His Phe Thr
        30                  35                  40

gtc gac gac gaa gac aac aac aac aac cat caa ggt ctt gac tta gcc      374
Val Asp Asp Glu Asp Asn Asn Asn Asn His Gln Gly Leu Asp Leu Ala
    45                  50                  55

tct ggt gga gga tca gga agc tct gga gga gga gga ggt cac ggc ggg      422
Ser Gly Gly Gly Ser Gly Ser Ser Gly Gly Gly Gly Gly His Gly Gly
60                  65                  70                  75

gga gga gac gtc gtt ggt cgt cgt cca cgt ggc aga cca ccg gga tcc      470
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Gly Gly Asp Val Val Gly Arg Arg Pro Arg Gly Arg Pro Pro Gly Ser
                80                  85                  90

aag aac aaa ccg aaa cct ccg gta att atc acg cgc gag agc gca aac      518
Lys Asn Lys Pro Lys Pro Pro Val Ile Ile Thr Arg Glu Ser Ala Asn
            95                  100                 105

act cta aga gct cac att ctt gaa gta aca aac ggc tgc gat gtt ttc      566
Thr Leu Arg Ala His Ile Leu Glu Val Thr Asn Gly Cys Asp Val Phe
        110                 115                 120

gac tgc gtt gcg act tat gct cgt cgg aga cag cga ggg atc tgc gtt      614
Asp Cys Val Ala Thr Tyr Ala Arg Arg Arg Gln Arg Gly Ile Cys Val
    125                 130                 135

ctg agc ggt agc gga acg gtc acg aac gtc agc ata cgt cag cca tct      662
Leu Ser Gly Ser Gly Thr Val Thr Asn Val Ser Ile Arg Gln Pro Ser
140                 145                 150                 155

gcg gct gga gcg gtt gtg acg cta caa gga acg ttc gag att ctt tct      710
Ala Ala Gly Ala Val Val Thr Leu Gln Gly Thr Phe Glu Ile Leu Ser
                160                 165                 170

ctc tcc gga tcg ttt ctt cct cct ccg gca cct ccc gga gca acg agt      758
Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala Pro Pro Gly Ala Thr Ser
            175                 180                 185

ttg aca att ttc tta gcc gga gga caa ggt cag gtg gtt gga gga agc      806
Leu Thr Ile Phe Leu Ala Gly Gly Gln Gly Gln Val Val Gly Gly Ser
        190                 195                 200

gtt gtg ggt gag ctt acg gcg gct gga ccg gtg att gtg att gca gct      854
Val Val Gly Glu Leu Thr Ala Ala Gly Pro Val Ile Val Ile Ala Ala
    205                 210                 215

tcg ttt act aat gtt gct tat gag aga ctt cct tta gaa gaa gat gag      902
Ser Phe Thr Asn Val Ala Tyr Glu Arg Leu Pro Leu Glu Glu Asp Glu
220                 225                 230                 235

cag cag caa cag ctt gga gga gga tct aac ggc gga ggt aat ttg ttt      950
Gln Gln Gln Gln Leu Gly Gly Gly Ser Asn Gly Gly Gly Asn Leu Phe
                240                 245                 250

ccg gag gtg gca gct gga gga gga gga gga ctt ccg ttc ttt aat tta      998
Pro Glu Val Ala Ala Gly Gly Gly Gly Gly Leu Pro Phe Phe Asn Leu
            255                 260                 265

ccg atg aat atg caa cca aat gtg caa ctt ccg gtg gaa ggt tgg ccg     1046
Pro Met Asn Met Gln Pro Asn Val Gln Leu Pro Val Glu Gly Trp Pro
        270                 275                 280

ggg aat tcc ggt gga aga ggt cct ttc tga tgtgtatata ttgataatca      1096
Gly Asn Ser Gly Gly Arg Gly Pro Phe
    285                 290

ttatatatat accggcggag aagcttttcc ggcgaagaat ttgcgagagt gaagaaaggt  1156
```

tagaaaagct tttaatggac taatgaattt caaattatca tcgtgatttc ggacattgtc 1216

ttgttcatca tgttaagctt aggtttattt tttgtcgttt gtagaatttt atgtttgaat 1276

ccttttttttt ttctgtgaaa ctctattgtg ttcgtctgcg aaggaaaaaa aaattctcaa 1336

aaaaaa 1342

<210> 420 <211> 292 <212> PRT <213> Arabidopsis thaliana <400> 420

Met Ala Gly Leu Asp Leu Gly Thr Ala Phe Arg Tyr Val Asn His Gln
1 5 10 15

Leu His Arg Pro Asp Leu His Leu His His Asn Ser Ser Ser Asp Asp
20 25 30

Val Thr Pro Gly Ala Gly Met Gly His Phe Thr Val Asp Asp Glu Asp
35 40 45

Asn Asn Asn Asn His Gln Gly Leu Asp Leu Ala Ser Gly Gly Gly Ser
50 55 60

Gly Ser Ser Gly Gly Gly Gly Gly His Gly Gly Gly Gly Asp Val Val
65 70 75 80

Gly Arg Arg Pro Arg Gly Arg Pro Pro Gly Ser Lys Asn Lys Pro Lys
85 90 95

Pro Pro Val Ile Ile Thr Arg Glu Ser Ala Asn Thr Leu Arg Ala His
100 105 110

Ile Leu Glu Val Thr Asn Gly Cys Asp Val Phe Asp Cys Val Ala Thr
115 120 125

Tyr Ala Arg Arg Arg Gln Arg Gly Ile Cys Val Leu Ser Gly Ser Gly
130 135 140

Thr Val Thr Asn Val Ser Ile Arg Gln Pro Ser Ala Ala Gly Ala Val
145 150 155 160

Val Thr Leu Gln Gly Thr Phe Glu Ile Leu Ser Leu Ser Gly Ser Phe
165 170 175

Leu Pro Pro Pro Ala Pro Pro Gly Ala Thr Ser Leu Thr Ile Phe Leu
180 185 190

```
Ala Gly Gly Gln Gly Gln Val Val Gly Gly Ser Val Val Gly Glu Leu
        195                 200                 205

Thr Ala Ala Gly Pro Val Ile Val Ile Ala Ala Ser Phe Thr Asn Val
    210                 215                 220

Ala Tyr Glu Arg Leu Pro Leu Glu Glu Asp Glu Gln Gln Gln Gln Leu
225                 230                 235                 240

Gly Gly Gly Ser Asn Gly Gly Gly Asn Leu Phe Pro Glu Val Ala Ala
                245                 250                 255

Gly Gly Gly Gly Gly Leu Pro Phe Phe Asn Leu Pro Met Asn Met Gln
            260                 265                 270

Pro Asn Val Gln Leu Pro Val Glu Gly Trp Pro Gly Asn Ser Gly Gly
        275                 280                 285

Arg Gly Pro Phe
    290
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<210> 421 <211> 1556 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1260) <223> G1128

<400> 421

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atg gag gag aga gaa gga act aac atc aac aac atc cca acc agt ttt       48
Met Glu Glu Arg Glu Gly Thr Asn Ile Asn Asn Ile Pro Thr Ser Phe
1               5                   10                  15

ggt ctg aaa caa cat gaa act cct ctt cct cct cct ggt tac cca cca       96
Gly Leu Lys Gln His Glu Thr Pro Leu Pro Pro Pro Gly Tyr Pro Pro
            20                  25                  30

cgg tct gaa aac cct aat ctt ttt ccg gtg ggt caa tcc agc act tcc      144
Arg Ser Glu Asn Pro Asn Leu Phe Pro Val Gly Gln Ser Ser Thr Ser
        35                  40                  45

tcc gcc gcc gcc gcg gtg aaa cct tct gag aat gtt gct cct cct ttt      192
Ser Ala Ala Ala Ala Val Lys Pro Ser Glu Asn Val Ala Pro Pro Phe
    50                  55                  60

agc tta aca atg ccg gtg gag aat tct tct tct gag ttg aag aag aag      240
Ser Leu Thr Met Pro Val Glu Asn Ser Ser Ser Glu Leu Lys Lys Lys
65                  70                  75                  80

aga ggg aga cca aga aag tat aac cct gac ggc tca ctc gct gtg act      288
Arg Gly Arg Pro Arg Lys Tyr Asn Pro Asp Gly Ser Leu Ala Val Thr
                85                  90                  95
```

```
ctc tct cct atg cct atc tca tcc tcc gtt ccg ttg acg tcg gag ttt      336
Leu Ser Pro Met Pro Ile Ser Ser Ser Val Pro Leu Thr Ser Glu Phe
            100                 105                 110

ggt tct cgg aaa cga gga aga ggt cga gga aga ggc aga gga aga gga      384
Gly Ser Arg Lys Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
        115                 120                 125

cga gga cgt gga caa gga caa gga agc aga gag ccc aat aac aac aac      432
Arg Gly Arg Gly Gln Gly Gln Gly Ser Arg Glu Pro Asn Asn Asn Asn
    130                 135                 140

aac gac aac aat tgg ctc aag aat cct cag atg ttc gaa ttt aac aac      480
Asn Asp Asn Asn Trp Leu Lys Asn Pro Gln Met Phe Glu Phe Asn Asn
145                 150                 155                 160

aac act cct act tct ggt gga gga gga cct gct gaa att gtc agt cca      528
Asn Thr Pro Thr Ser Gly Gly Gly Gly Pro Ala Glu Ile Val Ser Pro
                165                 170                 175

agt ttt aca cct cat gtg ctc aca gta aat gcc ggt gag gat gtg aca      576
Ser Phe Thr Pro His Val Leu Thr Val Asn Ala Gly Glu Asp Val Thr
            180                 185                 190

atg aag ata atg aca ttc tct caa caa ggc tcg cgt gct att tgt att      624
Met Lys Ile Met Thr Phe Ser Gln Gln Gly Ser Arg Ala Ile Cys Ile
        195                 200                 205

ctt tca gcg aac ggt ccc ata tcc aat gtt aca ctt cgt caa tct atg      672
Leu Ser Ala Asn Gly Pro Ile Ser Asn Val Thr Leu Arg Gln Ser Met
    210                 215                 220

aca tct ggt ggt act ctc act tat gag ggt cat ttt gag att ctt tct      720
Thr Ser Gly Gly Thr Leu Thr Tyr Glu Gly His Phe Glu Ile Leu Ser
225                 230                 235                 240

ttg acg ggt tcg ttt ata cca agc gag agt gga gga acc cga agc aga      768
Leu Thr Gly Ser Phe Ile Pro Ser Glu Ser Gly Gly Thr Arg Ser Arg
                245                 250                 255

gct ggt ggg atg agt gtc tct ctt gca gga caa gat ggt cgt gtc ttt      816
Ala Gly Gly Met Ser Val Ser Leu Ala Gly Gln Asp Gly Arg Val Phe
            260                 265                 270

ggt ggt gga ctt gct ggt ctc ttt att gcc gct ggt cct gtt cag gta      864
Gly Gly Gly Leu Ala Gly Leu Phe Ile Ala Ala Gly Pro Val Gln Val
        275                 280                 285

atg gta ggg agt ttt ata gcg ggt cag gag gaa tcg cag cag cag cag      912
Met Val Gly Ser Phe Ile Ala Gly Gln Glu Glu Ser Gln Gln Gln Gln
    290                 295                 300

cag cag ata aag aag caa aga agg gaa aga ctc ggg atc ccg aca aca      960
Gln Gln Ile Lys Lys Gln Arg Arg Glu Arg Leu Gly Ile Pro Thr Thr
305                 310                 315                 320
```

Sequence Listing

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aca caa gct tct aat atc tca ttc ggt ggc tca gcg gaa gat cct aag     1008
Thr Gln Ala Ser Asn Ile Ser Phe Gly Gly Ser Ala Glu Asp Pro Lys
                325                 330                 335

gct aga tac ggg ctc aac aag cct gtt gtt att cag cca cca ccg gtg     1056
Ala Arg Tyr Gly Leu Asn Lys Pro Val Val Ile Gln Pro Pro Pro Val
            340                 345                 350

tct gca cca cct gtg tcc ttt tcg cat gaa cca agt act aac acc gtc     1104
Ser Ala Pro Pro Val Ser Phe Ser His Glu Pro Ser Thr Asn Thr Val
        355                 360                 365

cat ggt tac tat gca aat aac aca gct aac cat atc aag gat ctc ttc     1152
His Gly Tyr Tyr Ala Asn Asn Thr Ala Asn His Ile Lys Asp Leu Phe
    370                 375                 380

tct tcc ctc cct gga gaa gat agg gaa gaa gat gag gat gat tta gaa     1200
Ser Ser Leu Pro Gly Glu Asp Arg Glu Glu Asp Glu Asp Asp Leu Glu
385                 390                 395                 400

ggt gaa gat gat gaa gaa ttc gga ggc cat agc gaa tct gac acc gag     1248
Gly Glu Asp Asp Glu Glu Phe Gly Gly His Ser Glu Ser Asp Thr Glu
                405                 410                 415

gtt cca agc tga tgatcgatgg aaagaatccg acatatatgt gttatgaatc         1300
Val Pro Ser

ttgagttgtt ttatttcggt gtcttcagat ttttttagag cgtaatggta ttttttttct   1360

ttcagattgt tagttgttaa agtcttaaac agagatattt cactaaaagt tagggtttac   1420

tagaggatgt aatctttagg gttctttgac ttgtgtcttt cttttaatcc tcagatggtt   1480

gttgtaggct tgtagccaat cttagtgtgt gttcaaactc tctccttcaa tcaaactccc   1540

caatgacttc attttg                                                   1556

<210>  422 <211>  419 <212>  PRT <213>  Arabidopsis thaliana  <400>  422

Met Glu Glu Arg Glu Gly Thr Asn Ile Asn Asn Ile Pro Thr Ser Phe
1               5                   10                  15

Gly Leu Lys Gln His Glu Thr Pro Leu Pro Pro Pro Gly Tyr Pro Pro
            20                  25                  30

Arg Ser Glu Asn Pro Asn Leu Phe Pro Val Gly Gln Ser Ser Thr Ser
        35                  40                  45

Ser Ala Ala Ala Ala Val Lys Pro Ser Glu Asn Val Ala Pro Pro Phe
    50                  55                  60
```

Ser Leu Thr Met Pro Val Glu Asn Ser Ser Ser Glu Leu Lys Lys Lys
65 70 75 80

Arg Gly Arg Pro Arg Lys Tyr Asn Pro Asp Gly Ser Leu Ala Val Thr
85 90 95

Leu Ser Pro Met Pro Ile Ser Ser Ser Val Pro Leu Thr Ser Glu Phe
100 105 110

Gly Ser Arg Lys Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
115 120 125

Arg Gly Arg Gly Gln Gly Gln Gly Ser Arg Glu Pro Asn Asn Asn Asn
130 135 140

Asn Asp Asn Asn Trp Leu Lys Asn Pro Gln Met Phe Glu Phe Asn Asn
145 150 155 160

Asn Thr Pro Thr Ser Gly Gly Gly Gly Pro Ala Glu Ile Val Ser Pro
165 170 175

Ser Phe Thr Pro His Val Leu Thr Val Asn Ala Gly Glu Asp Val Thr
180 185 190

Met Lys Ile Met Thr Phe Ser Gln Gln Gly Ser Arg Ala Ile Cys Ile
195 200 205

Leu Ser Ala Asn Gly Pro Ile Ser Asn Val Thr Leu Arg Gln Ser Met
210 215 220

Thr Ser Gly Gly Thr Leu Thr Tyr Glu Gly His Phe Glu Ile Leu Ser
225 230 235 240

Leu Thr Gly Ser Phe Ile Pro Ser Glu Ser Gly Gly Thr Arg Ser Arg
245 250 255

Ala Gly Gly Met Ser Val Ser Leu Ala Gly Gln Asp Gly Arg Val Phe
260 265 270

Gly Gly Gly Leu Ala Gly Leu Phe Ile Ala Ala Gly Pro Val Gln Val
275 280 285

Met Val Gly Ser Phe Ile Ala Gly Gln Glu Glu Ser Gln Gln Gln Gln

290 295 300

Gln Gln Ile Lys Lys Gln Arg Arg Glu Arg Leu Gly Ile Pro Thr Thr
305 310 315 320

Thr Gln Ala Ser Asn Ile Ser Phe Gly Gly Ser Ala Glu Asp Pro Lys
325 330 335

Ala Arg Tyr Gly Leu Asn Lys Pro Val Val Ile Gln Pro Pro Pro Val
340 345 350

Ser Ala Pro Pro Val Ser Phe Ser His Glu Pro Ser Thr Asn Thr Val
355 360 365

His Gly Tyr Tyr Ala Asn Asn Thr Ala Asn His Ile Lys Asp Leu Phe
370 375 380

Ser Ser Leu Pro Gly Glu Asp Arg Glu Glu Asp Glu Asp Asp Leu Glu
385 390 395 400

Gly Glu Asp Asp Glu Glu Phe Gly Gly His Ser Glu Ser Asp Thr Glu
405 410 415

Val Pro Ser

<210> 423 <211> 1322 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (104)..(1084) <223> G1133

<400> 423
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tattgtattc ctgtaaagtt cccttggctt aaactgcaag agc atg cct ctt gat 115
Met Pro Leu Asp
1

acc aaa cag cag aaa tgg ttg cca tta ggc tta aat cct caa gct tgt 163
Thr Lys Gln Gln Lys Trp Leu Pro Leu Gly Leu Asn Pro Gln Ala Cys
5 10 15 20

gtc cag gac aag gcg act gag tat ttc cgt cct gga att cct ttt ccg 211
Val Gln Asp Lys Ala Thr Glu Tyr Phe Arg Pro Gly Ile Pro Phe Pro
25 30 35

gaa ctc ggt aaa gtt tat gca gct gag cat cag ttt cgc tat ttg cag 259
Glu Leu Gly Lys Val Tyr Ala Ala Glu His Gln Phe Arg Tyr Leu Gln
40 45 50

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cca ccg ttc caa gcc tta ttg tct aga tat gat cag cag tct tgt gga      307
Pro Pro Phe Gln Ala Leu Leu Ser Arg Tyr Asp Gln Gln Ser Cys Gly
        55                  60                  65

aaa caa gtt tca tgt ttg aat ggg cga tct agc aac ggt gct gct cca      355
Lys Gln Val Ser Cys Leu Asn Gly Arg Ser Ser Asn Gly Ala Ala Pro
    70                  75                  80

gag ggg gca ctc aag tct tct cgg aaa aga ttt ata gta ttc gat cag      403
Glu Gly Ala Leu Lys Ser Ser Arg Lys Arg Phe Ile Val Phe Asp Gln
85                  90                  95                  100

tcg gga gag cag act cgt ttg tta caa tgt gga ttt cct ctg cgg ttt      451
Ser Gly Glu Gln Thr Arg Leu Leu Gln Cys Gly Phe Pro Leu Arg Phe
                105                 110                 115

cct tct tct atg gat gca gag cga ggg aac att ctc ggt gcc cta cac      499
Pro Ser Ser Met Asp Ala Glu Arg Gly Asn Ile Leu Gly Ala Leu His
            120                 125                 130

cca gag aaa ggg ttt agt aaa gat cat gcc att caa gaa aag ata ttg      547
Pro Glu Lys Gly Phe Ser Lys Asp His Ala Ile Gln Glu Lys Ile Leu
        135                 140                 145

caa cat gaa gat cat gaa aat ggc gaa gaa gac tcg gaa atg cac gaa      595
Gln His Glu Asp His Glu Asn Gly Glu Glu Asp Ser Glu Met His Glu
    150                 155                 160

gac act gag gaa atc aac gcg tta ctg tat tct gat gat gac gat aat      643
Asp Thr Glu Glu Ile Asn Ala Leu Leu Tyr Ser Asp Asp Asp Asp Asn
165                 170                 175                 180

gat gat tgg gaa agt gat gat gaa gta atg agc act ggt cac tct cca      691
Asp Asp Trp Glu Ser Asp Asp Glu Val Met Ser Thr Gly His Ser Pro
                185                 190                 195

ttc aca gtt gaa caa caa gcg tgc aac ata aca aca gaa gag ctg gat      739
Phe Thr Val Glu Gln Gln Ala Cys Asn Ile Thr Thr Glu Glu Leu Asp
            200                 205                 210

gaa act gaa agc act gtt gat ggt cca ctt ctt aaa aga cag aaa cta      787
Glu Thr Glu Ser Thr Val Asp Gly Pro Leu Leu Lys Arg Gln Lys Leu
        215                 220                 225

ctg gac cat tcg tac aga gac tca tca cca tcc ctt gtg ggc acc act      835
Leu Asp His Ser Tyr Arg Asp Ser Ser Pro Ser Leu Val Gly Thr Thr
    230                 235                 240

aaa gtc aaa ggc tta tca gat gaa aac ctt cct gaa tca aac att tca      883
Lys Val Lys Gly Leu Ser Asp Glu Asn Leu Pro Glu Ser Asn Ile Ser
245                 250                 255                 260

agc aaa caa gaa acg ggt tct ggt ttg agc gac gag cag tca aga aaa      931
Ser Lys Gln Glu Thr Gly Ser Gly Leu Ser Asp Glu Gln Ser Arg Lys
                265                 270                 275

gac aag att cac acc gct ctg aga atc ctg gag agt gta gtt cca ggg      979
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Asp Lys Ile His Thr Ala Leu Arg Ile Leu Glu Ser Val Val Pro Gly
280 285 290

gca aag gga aaa gaa gct ctt tta cta cta gac gaa gcc att gat tac 1027
Ala Lys Gly Lys Glu Ala Leu Leu Leu Leu Asp Glu Ala Ile Asp Tyr
295 300 305

ctc aag ttg ctg aag caa agc tta aac tca tca aag ggt ttg aat aac 1075
Leu Lys Leu Leu Lys Gln Ser Leu Asn Ser Ser Lys Gly Leu Asn Asn
310 315 320

cat tgg tga aaaacctaca acccctttttg tcctattgat aaggcatgtt 1124
His Trp
325

tggttggtta aagagaagac atgggacaaa agataatcaa tgaggtaaag gactgatgaa 1184

gaagattctc tcaaattcat taacgtgggt ttgaaacaat tagaacacgc ctggtgaccc 1244

tagtgggacc gtatccactg ttcatctagc tggatcaata gtggtttact tttggatttg 1304

gcatgctctc tcaaaaaa 1322

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20 25 30

Ile Pro Phe Pro Glu Leu Gly Lys Val Tyr Ala Ala Glu His Gln Phe
35 40 45

Arg Tyr Leu Gln Pro Pro Phe Gln Ala Leu Leu Ser Arg Tyr Asp Gln
50 55 60

Gln Ser Cys Gly Lys Gln Val Ser Cys Leu Asn Gly Arg Ser Ser Asn
65 70 75 80

Gly Ala Ala Pro Glu Gly Ala Leu Lys Ser Ser Arg Lys Arg Phe Ile
85 90 95

Val Phe Asp Gln Ser Gly Glu Gln Thr Arg Leu Leu Gln Cys Gly Phe
100 105 110

Pro Leu Arg Phe Pro Ser Ser Met Asp Ala Glu Arg Gly Asn Ile Leu
115 120 125

Gly Ala Leu His Pro Glu Lys Gly Phe Ser Lys Asp His Ala Ile Gln
130 135 140

Glu Lys Ile Leu Gln His Glu Asp His Glu Asn Gly Glu Glu Asp Ser
145 150 155 160

Glu Met His Glu Asp Thr Glu Glu Ile Asn Ala Leu Leu Tyr Ser Asp
165 170 175

Asp Asp Asp Asn Asp Asp Trp Glu Ser Asp Asp Glu Val Met Ser Thr
180 185 190

Gly His Ser Pro Phe Thr Val Glu Gln Gln Ala Cys Asn Ile Thr Thr
195 200 205

Glu Glu Leu Asp Glu Thr Glu Ser Thr Val Asp Gly Pro Leu Leu Lys
210 215 220

Arg Gln Lys Leu Leu Asp His Ser Tyr Arg Asp Ser Ser Pro Ser Leu
225 230 235 240

Val Gly Thr Thr Lys Val Lys Gly Leu Ser Asp Glu Asn Leu Pro Glu
245 250 255

Ser Asn Ile Ser Ser Lys Gln Glu Thr Gly Ser Gly Leu Ser Asp Glu
260 265 270

Gln Ser Arg Lys Asp Lys Ile His Thr Ala Leu Arg Ile Leu Glu Ser
275 280 285

Val Val Pro Gly Ala Lys Gly Lys Glu Ala Leu Leu Leu Leu Asp Glu
290 295 300

Ala Ile Asp Tyr Leu Lys Leu Leu Lys Gln Ser Leu Asn Ser Ser Lys
305 310 315 320

Gly Leu Asn Asn His Trp
325

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                               Met Ala Lys Glu Asn Ser Ser His
                               1               5

agc ctt gca gaa gca aag aga aag aga ctc act tgg att ctt tgt gta         160
Ser Leu Ala Glu Ala Lys Arg Lys Arg Leu Thr Trp Ile Leu Cys Val
    10                  15                  20

agt gga ctt tgc ata ttg tct tat gtt ctt gga tct tgg caa acc aac         208
Ser Gly Leu Cys Ile Leu Ser Tyr Val Leu Gly Ser Trp Gln Thr Asn
25                  30                  35                  40

act gtc cca act tct tcc tct gag gct tac tca aga atg gga tgt gat         256
Thr Val Pro Thr Ser Ser Ser Glu Ala Tyr Ser Arg Met Gly Cys Asp
                45                  50                  55

gaa aca tca aca acc act cgg gct cag act act cag act caa aca aat         304
Glu Thr Ser Thr Thr Thr Arg Ala Gln Thr Thr Gln Thr Gln Thr Asn
            60                  65                  70

cct tct tct gac gat act tct tcc tct ttg tct tcc tca gaa cca gtt         352
Pro Ser Ser Asp Asp Thr Ser Ser Ser Leu Ser Ser Ser Glu Pro Val
        75                  80                  85

gag tta gat ttc gaa agc cat cac aaa ctc gag ctg aag att acg aat         400
Glu Leu Asp Phe Glu Ser His His Lys Leu Glu Leu Lys Ile Thr Asn
    90                  95                  100

caa acc gta aag tac ttt gag cca tgt gac atg tct ttg agt gag tac         448
Gln Thr Val Lys Tyr Phe Glu Pro Cys Asp Met Ser Leu Ser Glu Tyr
105                 110                 115                 120

act cca tgt gaa gat cga gag aga gga aga aga ttt gat agg aac atg         496
Thr Pro Cys Glu Asp Arg Glu Arg Gly Arg Arg Phe Asp Arg Asn Met
                125                 130                 135

atg aag tac aga gag aga cat tgt cct tct aaa gat gag ctt ctt tat         544
Met Lys Tyr Arg Glu Arg His Cys Pro Ser Lys Asp Glu Leu Leu Tyr
            140                 145                 150

tgt ctg att cct cct cca cca aac tac aag att cca ttc aag tgg cct         592
Cys Leu Ile Pro Pro Pro Pro Asn Tyr Lys Ile Pro Phe Lys Trp Pro
        155                 160                 165

caa agt aga gat tat gct tgg tac gac aac att cca cac aag gag ctt         640
Gln Ser Arg Asp Tyr Ala Trp Tyr Asp Asn Ile Pro His Lys Glu Leu
    170                 175                 180

agt att gag aaa gct atc cag aac tgg att caa gta gaa ggg gaa aga         688
Ser Ile Glu Lys Ala Ile Gln Asn Trp Ile Gln Val Glu Gly Glu Arg
185                 190                 195                 200

ttc agg ttc cct ggt ggt ggc aca atg ttt cca cgt gga gct gat gct         736
Phe Arg Phe Pro Gly Gly Gly Thr Met Phe Pro Arg Gly Ala Asp Ala
                205                 210                 215
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tac att gat gat att gct aga ctc att cct ctt act gat gga gcc att      784
Tyr Ile Asp Asp Ile Ala Arg Leu Ile Pro Leu Thr Asp Gly Ala Ile
            220                 225                 230

aga aca gct att gat aca gga tgt ggt gtg gcg agt ttt ggt gca tac      832
Arg Thr Ala Ile Asp Thr Gly Cys Gly Val Ala Ser Phe Gly Ala Tyr
        235                 240                 245

ttg ttg aag agg gat att gtg gct atg tca ttt gct cca agg gac act      880
Leu Leu Lys Arg Asp Ile Val Ala Met Ser Phe Ala Pro Arg Asp Thr
    250                 255                 260

cat gaa gct caa gtt caa ttt gcg ttg gaa cgt gga gtt cct gcg att      928
His Glu Ala Gln Val Gln Phe Ala Leu Glu Arg Gly Val Pro Ala Ile
265                 270                 275                 280

atc ggg att atg gga tca aga agg ctt cct tat cca gct aga gct ttt      976
Ile Gly Ile Met Gly Ser Arg Arg Leu Pro Tyr Pro Ala Arg Ala Phe
                285                 290                 295

gat ctt gct cac tgt tct cgt tgt ttg att cct tgg ttt caa aat gat     1024
Asp Leu Ala His Cys Ser Arg Cys Leu Ile Pro Trp Phe Gln Asn Asp
            300                 305                 310

ggt ttg tac ttg acc gaa gtg gac cgg gtt tta aga ccg ggc ggt tat     1072
Gly Leu Tyr Leu Thr Glu Val Asp Arg Val Leu Arg Pro Gly Gly Tyr
        315                 320                 325

tgg atc ctt tcg ggt cca ccg atc aac tgg aag aaa tac tgg aaa ggc     1120
Trp Ile Leu Ser Gly Pro Pro Ile Asn Trp Lys Lys Tyr Trp Lys Gly
    330                 335                 340

tgg gaa aga tca caa gag gat ttg aag caa gag caa gat tct ata gaa     1168
Trp Glu Arg Ser Gln Glu Asp Leu Lys Gln Glu Gln Asp Ser Ile Glu
345                 350                 355                 360

gat gca gca aga agt ctt tgt tgg aag aaa gtt aca gaa aag ggt gat     1216
Asp Ala Ala Arg Ser Leu Cys Trp Lys Lys Val Thr Glu Lys Gly Asp
                365                 370                 375

tta tca att tgg caa aag cct atc aat cac gtt gag tgt aac aaa ctc     1264
Leu Ser Ile Trp Gln Lys Pro Ile Asn His Val Glu Cys Asn Lys Leu
            380                 385                 390

aaa cga gtt cac aaa act cct cct cta tgc agt aaa tca gat tta ccc     1312
Lys Arg Val His Lys Thr Pro Pro Leu Cys Ser Lys Ser Asp Leu Pro
        395                 400                 405

gat ttt gct tgg tac aaa gat ttg gaa tct tgt gta aca cca tta cca     1360
Asp Phe Ala Trp Tyr Lys Asp Leu Glu Ser Cys Val Thr Pro Leu Pro
    410                 415                 420

gaa gca aac agt tca gac gaa ttc gca ggc ggt gca ttg gag gat tgg     1408
Glu Ala Asn Ser Ser Asp Glu Phe Ala Gly Gly Ala Leu Glu Asp Trp
425                 430                 435                 440
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cca aac cga gct ttt gcg gtg cca cct agg ata atc ggg gga acc att     1456
Pro Asn Arg Ala Phe Ala Val Pro Pro Arg Ile Ile Gly Gly Thr Ile
                445                 450                 455

ccg gac att aat gct gag aaa ttc aga gaa gac aat gaa gtg tgg aag     1504
Pro Asp Ile Asn Ala Glu Lys Phe Arg Glu Asp Asn Glu Val Trp Lys
            460                 465                 470

gag aga ata tca tat tac aaa cag ata atg cca gag ctt tca aga gga     1552
Glu Arg Ile Ser Tyr Tyr Lys Gln Ile Met Pro Glu Leu Ser Arg Gly
        475                 480                 485

aga ttt agg aac ata atg gac atg aat gca tac ttg gga gga ttt gct     1600
Arg Phe Arg Asn Ile Met Asp Met Asn Ala Tyr Leu Gly Gly Phe Ala
    490                 495                 500

gcg gca atg atg aaa tat cca tct tgg gtt atg aat gtg gtt cct gtg     1648
Ala Ala Met Met Lys Tyr Pro Ser Trp Val Met Asn Val Val Pro Val
505                 510                 515                 520

gat gct gag aag caa acg tta ggg gtt atc ttt gaa cga gga ttt ata     1696
Asp Ala Glu Lys Gln Thr Leu Gly Val Ile Phe Glu Arg Gly Phe Ile
                525                 530                 535

ggg act tat caa gat tgg tgt gaa gga ttc tct acg tat ccg aga act     1744
Gly Thr Tyr Gln Asp Trp Cys Glu Gly Phe Ser Thr Tyr Pro Arg Thr
            540                 545                 550

tat gat ttg att cat gct ggt gga ttg ttc agc att tat gag aac agg     1792
Tyr Asp Leu Ile His Ala Gly Gly Leu Phe Ser Ile Tyr Glu Asn Arg
        555                 560                 565

tgt gat gtt aca tta ata cta ctt gag atg gat aga att ttg aga cca     1840
Cys Asp Val Thr Leu Ile Leu Leu Glu Met Asp Arg Ile Leu Arg Pro
    570                 575                 580

gaa gga acc gtg gtg ttt aga gac act gtg gaa atg ttg acg aag ata     1888
Glu Gly Thr Val Val Phe Arg Asp Thr Val Glu Met Leu Thr Lys Ile
585                 590                 595                 600

caa agc ata acc aat gga atg agg tgg aag agt cgg att ttg gat cat     1936
Gln Ser Ile Thr Asn Gly Met Arg Trp Lys Ser Arg Ile Leu Asp His
                605                 610                 615

gag aga ggt cct ttt aat cct gag aag atc ctt ctc gct gta aaa tcc     1984
Glu Arg Gly Pro Phe Asn Pro Glu Lys Ile Leu Leu Ala Val Lys Ser
            620                 625                 630

tat tgg acc ggt cct tct tct tag ctagttctag ctttcttgga actctctact    2038
Tyr Trp Thr Gly Pro Ser Ser
        635

ctaatctttt tcttatcttg tgtgtctcat ctttgtttta tttttaattg tttgttttaa    2098

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Val Leu Gly Ser Trp Gln Thr Asn Thr Val Pro Thr Ser Ser Ser Glu
        35                  40                  45

Ala Tyr Ser Arg Met Gly Cys Asp Glu Thr Ser Thr Thr Thr Arg Ala
    50                  55                  60

Gln Thr Thr Gln Thr Gln Thr Asn Pro Ser Ser Asp Asp Thr Ser Ser
65                  70                  75                  80

Ser Leu Ser Ser Ser Glu Pro Val Glu Leu Asp Phe Glu Ser His His
                85                  90                  95

Lys Leu Glu Leu Lys Ile Thr Asn Gln Thr Val Lys Tyr Phe Glu Pro
            100                 105                 110

Cys Asp Met Ser Leu Ser Glu Tyr Thr Pro Cys Glu Asp Arg Glu Arg
        115                 120                 125

Gly Arg Arg Phe Asp Arg Asn Met Met Lys Tyr Arg Glu Arg His Cys
    130                 135                 140

Pro Ser Lys Asp Glu Leu Leu Tyr Cys Leu Ile Pro Pro Pro Pro Asn
145                 150                 155                 160

Tyr Lys Ile Pro Phe Lys Trp Pro Gln Ser Arg Asp Tyr Ala Trp Tyr
                165                 170                 175

Asp Asn Ile Pro His Lys Glu Leu Ser Ile Glu Lys Ala Ile Gln Asn
            180                 185                 190

Trp Ile Gln Val Glu Gly Glu Arg Phe Arg Phe Pro Gly Gly Gly Thr
        195                 200                 205

Met Phe Pro Arg Gly Ala Asp Ala Tyr Ile Asp Asp Ile Ala Arg Leu
    210                 215                 220
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Ile Pro Leu Thr Asp Gly Ala Ile Arg Thr Ala Ile Asp Thr Gly Cys
225 230 235 240

Gly Val Ala Ser Phe Gly Ala Tyr Leu Leu Lys Arg Asp Ile Val Ala
245 250 255

Met Ser Phe Ala Pro Arg Asp Thr His Glu Ala Gln Val Gln Phe Ala
260 265 270

Leu Glu Arg Gly Val Pro Ala Ile Ile Gly Ile Met Gly Ser Arg Arg
275 280 285

Leu Pro Tyr Pro Ala Arg Ala Phe Asp Leu Ala His Cys Ser Arg Cys
290 295 300

Leu Ile Pro Trp Phe Gln Asn Asp Gly Leu Tyr Leu Thr Glu Val Asp
305 310 315 320

Arg Val Leu Arg Pro Gly Gly Tyr Trp Ile Leu Ser Gly Pro Pro Ile
325 330 335

Asn Trp Lys Lys Tyr Trp Lys Gly Trp Glu Arg Ser Gln Glu Asp Leu
340 345 350

Lys Gln Glu Gln Asp Ser Ile Glu Asp Ala Ala Arg Ser Leu Cys Trp
355 360 365

Lys Lys Val Thr Glu Lys Gly Asp Leu Ser Ile Trp Gln Lys Pro Ile
370 375 380

Asn His Val Glu Cys Asn Lys Leu Lys Arg Val His Lys Thr Pro Pro
385 390 395 400

Leu Cys Ser Lys Ser Asp Leu Pro Asp Phe Ala Trp Tyr Lys Asp Leu
405 410 415

Glu Ser Cys Val Thr Pro Leu Pro Glu Ala Asn Ser Ser Asp Glu Phe
420 425 430

Ala Gly Gly Ala Leu Glu Asp Trp Pro Asn Arg Ala Phe Ala Val Pro
435 440 445

Pro Arg Ile Ile Gly Gly Thr Ile Pro Asp Ile Asn Ala Glu Lys Phe
450 455 460

Arg Glu Asp Asn Glu Val Trp Lys Glu Arg Ile Ser Tyr Tyr Lys Gln
465 470 475 480

Ile Met Pro Glu Leu Ser Arg Gly Arg Phe Arg Asn Ile Met Asp Met
485 490 495

Asn Ala Tyr Leu Gly Gly Phe Ala Ala Ala Met Met Lys Tyr Pro Ser
500 505 510

Trp Val Met Asn Val Val Pro Val Asp Ala Glu Lys Gln Thr Leu Gly
515 520 525

Val Ile Phe Glu Arg Gly Phe Ile Gly Thr Tyr Gln Asp Trp Cys Glu
530 535 540

Gly Phe Ser Thr Tyr Pro Arg Thr Tyr Asp Leu Ile His Ala Gly Gly
545 550 555 560

Leu Phe Ser Ile Tyr Glu Asn Arg Cys Asp Val Thr Leu Ile Leu Leu
565 570 575

Glu Met Asp Arg Ile Leu Arg Pro Glu Gly Thr Val Val Phe Arg Asp
580 585 590

Thr Val Glu Met Leu Thr Lys Ile Gln Ser Ile Thr Asn Gly Met Arg
595 600 605

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Val Ser Ser Ser Asp Asp Arg Lys Ile Val Ala Asp Thr Pro Asp Phe
            20                  25                  30

ata gac gaa tcc tct cta gtc atc aga aca acc act gga gtc cga atc      144
Ile Asp Glu Ser Ser Leu Val Ile Arg Thr Thr Thr Gly Val Arg Ile
        35                  40                  45

tca gct cta ccg gcg gag caa agc ctt gtt gac tcc gat gga tct aac      192
Ser Ala Leu Pro Ala Glu Gln Ser Leu Val Asp Ser Asp Gly Ser Asn
    50                  55                  60

tcg gag gtt acg ctt ccg gcg aaa gac gag gta att agt gat ggt ttt      240
Ser Glu Val Thr Leu Pro Ala Lys Asp Glu Val Ile Ser Asp Gly Phe
65                  70                  75                  80

act tgt gtg aac aaa gag att gta gaa tct gat tca ttt agg gag cag      288
Thr Cys Val Asn Lys Glu Ile Val Glu Ser Asp Ser Phe Arg Glu Gln
                85                  90                  95

aat cta gag att gga gaa cct gat tta gat gtt gag aat cgc aaa gaa      336
Asn Leu Glu Ile Gly Glu Pro Asp Leu Asp Val Glu Asn Arg Lys Glu
            100                 105                 110

gcg atg att att gat tcg ata gaa aat tct gtg gtt gaa att gtt tca      384
Ala Met Ile Ile Asp Ser Ile Glu Asn Ser Val Val Glu Ile Val Ser
        115                 120                 125

agt gct tct ggt gat gat tgt aat gtt aag gta gag gta gtg gaa cct      432
Ser Ala Ser Gly Asp Asp Cys Asn Val Lys Val Glu Val Val Glu Pro
    130                 135                 140

gaa ttg ctt gtt gag aat ctg gtg gtt gct aaa gaa gaa gaa gaa atg      480
Glu Leu Leu Val Glu Asn Leu Val Val Ala Lys Glu Glu Glu Glu Met
145                 150                 155                 160

att gtt gat tct ata gaa gat tct gtt gtt gaa att gtt tca act gct      528
Ile Val Asp Ser Ile Glu Asp Ser Val Val Glu Ile Val Ser Thr Ala
                165                 170                 175

tcg ggt tgt gat tgt aat gtg aag gtt gag gta gtg gac cct gaa ttg      576
Ser Gly Cys Asp Cys Asn Val Lys Val Glu Val Val Asp Pro Glu Leu
            180                 185                 190

tgt gtt gat aat ctg gtg gtt gtt aaa gaa gaa gaa atg att gct gat      624
Cys Val Asp Asn Leu Val Val Val Lys Glu Glu Glu Met Ile Ala Asp
        195                 200                 205

tcg ata gcg gaa tct gtg gtt gaa act gtt tcg aga ggt tta gat tat      672
Ser Ile Ala Glu Ser Val Val Glu Thr Val Ser Arg Gly Leu Asp Tyr
    210                 215                 220

gag tgt gtt gat gtc aag gtg aaa gaa gaa cct gat tta ggt aca aaa      720
Glu Cys Val Asp Val Lys Val Lys Glu Glu Pro Asp Leu Gly Thr Lys
225                 230                 235                 240

ttg gaa gaa gat tct gtt ttt ccg aat gtg ctt gag aag aag gat gag      768
Leu Glu Glu Asp Ser Val Phe Pro Asn Val Leu Glu Lys Lys Asp Glu
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                245                 250                 255

gta atc aaa gtc ctg gaa gac cag cca agt gag att aat aag aag cta      816
Val Ile Lys Val Leu Glu Asp Gln Pro Ser Glu Ile Asn Lys Lys Leu
            260                 265                 270

gag caa gag aat gat gat ctc ttt tcg tct gga gat tca gat ggt aca      864
Glu Gln Glu Asn Asp Asp Leu Phe Ser Ser Gly Asp Ser Asp Gly Thr
        275                 280                 285

tca gcc aag aga agg aaa atg gag atg gaa tca tat gca cca gtc ggt      912
Ser Ala Lys Arg Arg Lys Met Glu Met Glu Ser Tyr Ala Pro Val Gly
    290                 295                 300

gtg gaa agc tgt atc ctg gcg ccg acg cct ctt cga gtt gtg aaa cca      960
Val Glu Ser Cys Ile Leu Ala Pro Thr Pro Leu Arg Val Val Lys Pro
305                 310                 315                 320

gag aag ttg gat acc cct gaa gtt att gat ctg gaa tca gag aaa agt     1008
Glu Lys Leu Asp Thr Pro Glu Val Ile Asp Leu Glu Ser Glu Lys Ser
                325                 330                 335

tat act cat gtg aag atg gaa cct gtt gag gaa ata aag gtg gaa gct     1056
Tyr Thr His Val Lys Met Glu Pro Val Glu Glu Ile Lys Val Glu Ala
            340                 345                 350

gtt aag atg agt tct caa gtg gaa gat gtg aaa ttt agc cgt gag cag     1104
Val Lys Met Ser Ser Gln Val Glu Asp Val Lys Phe Ser Arg Glu Gln
        355                 360                 365

aaa tct gtg tat gtg aag aag gaa cca gtt gga gca aga aag gtg aaa     1152
Lys Ser Val Tyr Val Lys Lys Glu Pro Val Gly Ala Arg Lys Val Lys
    370                 375                 380

gtg gaa gat gga gat ttt ccg gtg gag aaa gat tgg tat ttg gtt ggg     1200
Val Glu Asp Gly Asp Phe Pro Val Glu Lys Asp Trp Tyr Leu Val Gly
385                 390                 395                 400

agg tca ctt gtt act gct act tct acg agt aaa gga agg aaa tta gaa     1248
Arg Ser Leu Val Thr Ala Thr Ser Thr Ser Lys Gly Arg Lys Leu Glu
                405                 410                 415

gat aat gag att gtg aat ttc aca ttt tct tct gtt gca aaa tgg aaa     1296
Asp Asn Glu Ile Val Asn Phe Thr Phe Ser Ser Val Ala Lys Trp Lys
            420                 425                 430

gtc cca aac att gtt cgt ttc tct acc aaa aga tgt gga gag att ggt     1344
Val Pro Asn Ile Val Arg Phe Ser Thr Lys Arg Cys Gly Glu Ile Gly
        435                 440                 445

aga ctt ccg atg gag tgg tca aat tgg gct gtg agc ctt tta aga tct     1392
Arg Leu Pro Met Glu Trp Ser Asn Trp Ala Val Ser Leu Leu Arg Ser
    450                 455                 460

ggt aag gtc aag atg tta ggc aga tgt gta gcg gcg cca cca ttt ctt     1440
Gly Lys Val Lys Met Leu Gly Arg Cys Val Ala Ala Pro Pro Phe Leu
465                 470                 475                 480
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aca atg atg caa gaa att atg cta tat gtc agt ttt tac att cac agc     1488
Thr Met Met Gln Glu Ile Met Leu Tyr Val Ser Phe Tyr Ile His Ser
                485                 490                 495

tcg ata ttc act gat gtt agc aaa tcc act tgg cgg att ggt tct tcc     1536
Ser Ile Phe Thr Asp Val Ser Lys Ser Thr Trp Arg Ile Gly Ser Ser
            500                 505                 510

cca aac ctt gag tcc acc ctt cat cct ctt ctc cag ctt ttc aaa cac     1584
Pro Asn Leu Glu Ser Thr Leu His Pro Leu Leu Gln Leu Phe Lys His
        515                 520                 525

ttg aca atc aaa cct tat caa aag gcg gag ttt act cct gag gaa ctc     1632
Leu Thr Ile Lys Pro Tyr Gln Lys Ala Glu Phe Thr Pro Glu Glu Leu
    530                 535                 540

aac tct cgt aaa cgt tca ctg aat ttg gag gat gac tat gat gaa aga     1680
Asn Ser Arg Lys Arg Ser Leu Asn Leu Glu Asp Asp Tyr Asp Glu Arg
545                 550                 555                 560

gca gca ttg ttg gcc ata gca aaa aga aga aaa ggt tgt caa cag tct     1728
Ala Ala Leu Leu Ala Ile Ala Lys Arg Arg Lys Gly Cys Gln Gln Ser
                565                 570                 575

ctg gag cag aac aaa gat gaa gaa gag gct cct gag tca tat atg aat     1776
Leu Glu Gln Asn Lys Asp Glu Glu Glu Ala Pro Glu Ser Tyr Met Asn
            580                 585                 590

cgg gtt gtc ggc gct gcc gat tca tac aac ctt gag gaa atg gaa gct     1824
Arg Val Val Gly Ala Ala Asp Ser Tyr Asn Leu Glu Glu Met Glu Ala
        595                 600                 605

cca agt aca ctc acg tgt aac ctg aga ccg tac cag aaa caa gct ctc     1872
Pro Ser Thr Leu Thr Cys Asn Leu Arg Pro Tyr Gln Lys Gln Ala Leu
    610                 615                 620

tac tgg atg tcg gaa tct gag aaa gga att gat gtt gaa aag gca gct     1920
Tyr Trp Met Ser Glu Ser Glu Lys Gly Ile Asp Val Glu Lys Ala Ala
625                 630                 635                 640

gaa act cta cat cct tgc tgg gag gct tat cga atc tgt gac gag agg     1968
Glu Thr Leu His Pro Cys Trp Glu Ala Tyr Arg Ile Cys Asp Glu Arg
                645                 650                 655

gca cct tct att tat ttg aac atc ttt agt ggt gaa gca aca atc cag     2016
Ala Pro Ser Ile Tyr Leu Asn Ile Phe Ser Gly Glu Ala Thr Ile Gln
            660                 665                 670

ttt cca aca gca acg cag atg gca aga ggc gga ata ttg gca gat gcc     2064
Phe Pro Thr Ala Thr Gln Met Ala Arg Gly Gly Ile Leu Ala Asp Ala
        675                 680                 685

atg gga ctt ggt aaa act gtg atg aca att gca cta ata ctt gca cgg     2112
Met Gly Leu Gly Lys Thr Val Met Thr Ile Ala Leu Ile Leu Ala Arg
    690                 695                 700
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cca ggc cga ggt aac ccg gaa aat gaa gat gtc ttg gtg gca gat gtt     2160
Pro Gly Arg Gly Asn Pro Glu Asn Glu Asp Val Leu Val Ala Asp Val
705                 710                 715                 720

aat gca gat aaa cgc aat agg aag gag att cat atg gca cta acg act     2208
Asn Ala Asp Lys Arg Asn Arg Lys Glu Ile His Met Ala Leu Thr Thr
                725                 730                 735

gtg aag gca aaa gga ggc act ctt att att tgt ccc atg gca ttg tta     2256
Val Lys Ala Lys Gly Gly Thr Leu Ile Ile Cys Pro Met Ala Leu Leu
            740                 745                 750

agc caa tgg aag gac gag ctt gag act cat tca aag cct gac act gtg     2304
Ser Gln Trp Lys Asp Glu Leu Glu Thr His Ser Lys Pro Asp Thr Val
        755                 760                 765

tct gtg tta gtt tac tat gga ggg gat agg aca cat gac gcg aaa gca     2352
Ser Val Leu Val Tyr Tyr Gly Gly Asp Arg Thr His Asp Ala Lys Ala
    770                 775                 780

ata gcg agt cat gat gtg gtt ttg aca act tat ggt gtt tta acc tca     2400
Ile Ala Ser His Asp Val Val Leu Thr Thr Tyr Gly Val Leu Thr Ser
785                 790                 795                 800

gct tac aag cag gat atg gca aac agt att ttc cac agg att gat tgg     2448
Ala Tyr Lys Gln Asp Met Ala Asn Ser Ile Phe His Arg Ile Asp Trp
                805                 810                 815

tat agg att gtt ctt gat gaa gct cac acg atc aaa tca tgg aaa act     2496
Tyr Arg Ile Val Leu Asp Glu Ala His Thr Ile Lys Ser Trp Lys Thr
            820                 825                 830

caa gct gct aaa gcc aca ttt gag tta tct tca cat tgc aga tgg tgt     2544
Gln Ala Ala Lys Ala Thr Phe Glu Leu Ser Ser His Cys Arg Trp Cys
        835                 840                 845

ctg act ggg act ccc tta caa aac aag ctc gaa gat cta tac agt ctt     2592
Leu Thr Gly Thr Pro Leu Gln Asn Lys Leu Glu Asp Leu Tyr Ser Leu
    850                 855                 860

cta tgt ttc ctg cat gtt gaa cca tgg tgc aat tgg gct tgg tgg agt     2640
Leu Cys Phe Leu His Val Glu Pro Trp Cys Asn Trp Ala Trp Trp Ser
865                 870                 875                 880

aag ttg ata cag aag cct tat gaa aat ggt gat cca cga gga ctg aag     2688
Lys Leu Ile Gln Lys Pro Tyr Glu Asn Gly Asp Pro Arg Gly Leu Lys
                885                 890                 895

ctg atc aag gcg att ttg agg cca ttg atg ctg aga aga aca aag gaa     2736
Leu Ile Lys Ala Ile Leu Arg Pro Leu Met Leu Arg Arg Thr Lys Glu
            900                 905                 910

aca agg gac aaa gaa gga agt cta att ctt gaa ctt cct cca acc gac     2784
Thr Arg Asp Lys Glu Gly Ser Leu Ile Leu Glu Leu Pro Pro Thr Asp
        915                 920                 925

gtc caa gtc att gaa tgt gaa caa tct gaa gca gaa cgt gac ttc tat     2832
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Val Gln Val Ile Glu Cys Glu Gln Ser Glu Ala Glu Arg Asp Phe Tyr
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aca gcc ttg ttc aag aga tcc aaa gtc caa ttt gac cag ttt gtg gca     2880
Thr Ala Leu Phe Lys Arg Ser Lys Val Gln Phe Asp Gln Phe Val Ala
945                 950                 955                 960

caa gga aaa gtt ctt cac aac tat gca aac atc ctc gag ctc ctc ctc     2928
Gln Gly Lys Val Leu His Asn Tyr Ala Asn Ile Leu Glu Leu Leu Leu
                965                 970                 975

cgt cta cgc caa tgt tgt aac cac cct ttt cta gtt atg agc cga gca     2976
Arg Leu Arg Gln Cys Cys Asn His Pro Phe Leu Val Met Ser Arg Ala
            980                 985                 990

gat tca caa cag tac gct gac tta  gat agc ctt gca agg  agg ttt ctt   3024
Asp Ser Gln Gln Tyr Ala Asp Leu  Asp Ser Leu Ala Arg  Arg Phe Leu
        995                 1000                1005

gat aac  aac cct gac tct gtt  tcc caa aat gct cct  tct cgg gca      3069
Asp Asn  Asn Pro Asp Ser Val  Ser Gln Asn Ala Pro  Ser Arg Ala
    1010                1015                1020

tat atc  gaa gaa gtt atc caa  gat tta cgc gat ggc  aat agc aaa      3114
Tyr Ile  Glu Glu Val Ile Gln  Asp Leu Arg Asp Gly  Asn Ser Lys
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gaa tgt  cca ata tgt ctg gag  tct gca gat gat ccc  gtt ctc aca      3159
Glu Cys  Pro Ile Cys Leu Glu  Ser Ala Asp Asp Pro  Val Leu Thr
    1040                1045                1050

cct tgt  gct cac aga atg tgc  cgt gaa tgt ctc ctt  act agc tgg      3204
Pro Cys  Ala His Arg Met Cys  Arg Glu Cys Leu Leu  Thr Ser Trp
    1055                1060                1065

cgc tct  cca tct tgt ggt cta  tgc cca atc tgc agg  aca atc ctg      3249
Arg Ser  Pro Ser Cys Gly Leu  Cys Pro Ile Cys Arg  Thr Ile Leu
    1070                1075                1080

aag aga  acc gaa ctt atc tca  tgc ccg aca gat agt  ata ttc cgt      3294
Lys Arg  Thr Glu Leu Ile Ser  Cys Pro Thr Asp Ser  Ile Phe Arg
    1085                1090                1095

gtt gat  gtg gta aag aac tgg  aag gag tct tca aag  gtt tcg gag      3339
Val Asp  Val Val Lys Asn Trp  Lys Glu Ser Ser Lys  Val Ser Glu
    1100                1105                1110

ctg ctc  aag tgc tta gag aag  atc aag aaa tct ggt  tcg ggc gag      3384
Leu Leu  Lys Cys Leu Glu Lys  Ile Lys Lys Ser Gly  Ser Gly Glu
    1115                1120                1125

aag agc  att gtc ttt agc cag  tgg act tca ttt ttg  gat ctt ttg      3429
Lys Ser  Ile Val Phe Ser Gln  Trp Thr Ser Phe Leu  Asp Leu Leu
    1130                1135                1140

gag att  cca ttg cga aga aga  gga ttt gag ttt ctt  aga ttc gat      3474
Glu Ile  Pro Leu Arg Arg Arg  Gly Phe Glu Phe Leu  Arg Phe Asp
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    1145                1150                1155

ggg aag  ctg gct cag aag gga  aga gaa aag gtt ttg  aaa gag ttc      3519
Gly Lys  Leu Ala Gln Lys Gly  Arg Glu Lys Val Leu  Lys Glu Phe
    1160                1165                1170

aat gaa  acc aaa cag aaa acg  att ctg ctt atg tct  ctg aaa gct      3564
Asn Glu  Thr Lys Gln Lys Thr  Ile Leu Leu Met Ser  Leu Lys Ala
    1175                1180                1185

gga gga  gtc ggt ctg aat cta  act gca gct tca agt  gtc ttc tta      3609
Gly Gly  Val Gly Leu Asn Leu  Thr Ala Ala Ser Ser  Val Phe Leu
    1190                1195                1200

atg gat  cca tgg tgg aat cca  gcg gtg gaa gag caa  gcg atc atg      3654
Met Asp  Pro Trp Trp Asn Pro  Ala Val Glu Glu Gln  Ala Ile Met
    1205                1210                1215

aga att  cat cga ata ggg cag  aaa cga acg gta ttc  gtc aga aga      3699
Arg Ile  His Arg Ile Gly Gln  Lys Arg Thr Val Phe  Val Arg Arg
    1220                1225                1230

ttc att  gtc aag gat aca gtg  gag gaa cgg atg cag  caa gtt cag      3744
Phe Ile  Val Lys Asp Thr Val  Glu Glu Arg Met Gln  Gln Val Gln
    1235                1240                1245

gca agg  aag cag agg atg att  gcc gga gct ttg aca  gat gaa gaa      3789
Ala Arg  Lys Gln Arg Met Ile  Ala Gly Ala Leu Thr  Asp Glu Glu
    1250                1255                1260

gtc cgg  tct gca aga ctt gag  gag ctt aaa atg ttg  ttc cga tga      3834
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Ile Asp Glu Ser Ser Leu Val Ile Arg Thr Thr Thr Gly Val Arg Ile
        35                  40                  45

Ser Ala Leu Pro Ala Glu Gln Ser Leu Val Asp Ser Asp Gly Ser Asn
    50                  55                  60

Ser Glu Val Thr Leu Pro Ala Lys Asp Glu Val Ile Ser Asp Gly Phe
65                  70                  75                  80
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Thr Cys Val Asn Lys Glu Ile Val Glu Ser Asp Ser Phe Arg Glu Gln
85 90 95

Asn Leu Glu Ile Gly Glu Pro Asp Leu Asp Val Glu Asn Arg Lys Glu
100 105 110

Ala Met Ile Ile Asp Ser Ile Glu Asn Ser Val Val Glu Ile Val Ser
115 120 125

Ser Ala Ser Gly Asp Asp Cys Asn Val Lys Val Glu Val Val Glu Pro
130 135 140

Glu Leu Leu Val Glu Asn Leu Val Val Ala Lys Glu Glu Glu Glu Met
145 150 155 160

Ile Val Asp Ser Ile Glu Asp Ser Val Val Glu Ile Val Ser Thr Ala
165 170 175

Ser Gly Cys Asp Cys Asn Val Lys Val Glu Val Val Asp Pro Glu Leu
180 185 190

Cys Val Asp Asn Leu Val Val Val Lys Glu Glu Glu Met Ile Ala Asp
195 200 205

Ser Ile Ala Glu Ser Val Val Glu Thr Val Ser Arg Gly Leu Asp Tyr
210 215 220

Glu Cys Val Asp Val Lys Val Lys Glu Glu Pro Asp Leu Gly Thr Lys
225 230 235 240

Leu Glu Glu Asp Ser Val Phe Pro Asn Val Leu Glu Lys Lys Asp Glu
245 250 255

Val Ile Lys Val Leu Glu Asp Gln Pro Ser Glu Ile Asn Lys Lys Leu
260 265 270

Glu Gln Glu Asn Asp Asp Leu Phe Ser Ser Gly Asp Ser Asp Gly Thr
275 280 285

Ser Ala Lys Arg Arg Lys Met Glu Met Glu Ser Tyr Ala Pro Val Gly
290 295 300

Val Glu Ser Cys Ile Leu Ala Pro Thr Pro Leu Arg Val Val Lys Pro

305 310 315 320

Glu Lys Leu Asp Thr Pro Glu Val Ile Asp Leu Glu Ser Glu Lys Ser
325 330 335

Tyr Thr His Val Lys Met Glu Pro Val Glu Glu Ile Lys Val Glu Ala
340 345 350

Val Lys Met Ser Ser Gln Val Glu Asp Val Lys Phe Ser Arg Glu Gln
355 360 365

Lys Ser Val Tyr Val Lys Lys Glu Pro Val Gly Ala Arg Lys Val Lys
370 375 380

Val Glu Asp Gly Asp Phe Pro Val Glu Lys Asp Trp Tyr Leu Val Gly
385 390 395 400

Arg Ser Leu Val Thr Ala Thr Ser Thr Ser Lys Gly Arg Lys Leu Glu
405 410 415

Asp Asn Glu Ile Val Asn Phe Thr Phe Ser Ser Val Ala Lys Trp Lys
420 425 430

Val Pro Asn Ile Val Arg Phe Ser Thr Lys Arg Cys Gly Glu Ile Gly
435 440 445

Arg Leu Pro Met Glu Trp Ser Asn Trp Ala Val Ser Leu Leu Arg Ser
450 455 460

Gly Lys Val Lys Met Leu Gly Arg Cys Val Ala Ala Pro Pro Phe Leu
465 470 475 480

Thr Met Met Gln Glu Ile Met Leu Tyr Val Ser Phe Tyr Ile His Ser
485 490 495

Ser Ile Phe Thr Asp Val Ser Lys Ser Thr Trp Arg Ile Gly Ser Ser
500 505 510

Pro Asn Leu Glu Ser Thr Leu His Pro Leu Leu Gln Leu Phe Lys His
515 520 525

Leu Thr Ile Lys Pro Tyr Gln Lys Ala Glu Phe Thr Pro Glu Glu Leu
530 535 540

Asn Ser Arg Lys Arg Ser Leu Asn Leu Glu Asp Asp Tyr Asp Glu Arg
545 550 555 560

Ala Ala Leu Leu Ala Ile Ala Lys Arg Arg Lys Gly Cys Gln Gln Ser
565 570 575

Leu Glu Gln Asn Lys Asp Glu Glu Glu Ala Pro Glu Ser Tyr Met Asn
580 585 590

Arg Val Val Gly Ala Ala Asp Ser Tyr Asn Leu Glu Glu Met Glu Ala
595 600 605

Pro Ser Thr Leu Thr Cys Asn Leu Arg Pro Tyr Gln Lys Gln Ala Leu
610 615 620

Tyr Trp Met Ser Glu Ser Glu Lys Gly Ile Asp Val Glu Lys Ala Ala
625 630 635 640

Glu Thr Leu His Pro Cys Trp Glu Ala Tyr Arg Ile Cys Asp Glu Arg
645 650 655

Ala Pro Ser Ile Tyr Leu Asn Ile Phe Ser Gly Glu Ala Thr Ile Gln
660 665 670

Phe Pro Thr Ala Thr Gln Met Ala Arg Gly Gly Ile Leu Ala Asp Ala
675 680 685

Met Gly Leu Gly Lys Thr Val Met Thr Ile Ala Leu Ile Leu Ala Arg
690 695 700

Pro Gly Arg Gly Asn Pro Glu Asn Glu Asp Val Leu Val Ala Asp Val
705 710 715 720

Asn Ala Asp Lys Arg Asn Arg Lys Glu Ile His Met Ala Leu Thr Thr
725 730 735

Val Lys Ala Lys Gly Gly Thr Leu Ile Ile Cys Pro Met Ala Leu Leu
740 745 750

Ser Gln Trp Lys Asp Glu Leu Glu Thr His Ser Lys Pro Asp Thr Val
755 760 765

Ser Val Leu Val Tyr Tyr Gly Gly Asp Arg Thr His Asp Ala Lys Ala
770 775 780

Ile Ala Ser His Asp Val Val Leu Thr Thr Tyr Gly Val Leu Thr Ser
785 790 795 800

Ala Tyr Lys Gln Asp Met Ala Asn Ser Ile Phe His Arg Ile Asp Trp
805 810 815

Tyr Arg Ile Val Leu Asp Glu Ala His Thr Ile Lys Ser Trp Lys Thr
820 825 830

Gln Ala Ala Lys Ala Thr Phe Glu Leu Ser Ser His Cys Arg Trp Cys
835 840 845

Leu Thr Gly Thr Pro Leu Gln Asn Lys Leu Glu Asp Leu Tyr Ser Leu
850 855 860

Leu Cys Phe Leu His Val Glu Pro Trp Cys Asn Trp Ala Trp Trp Ser
865 870 875 880

Lys Leu Ile Gln Lys Pro Tyr Glu Asn Gly Asp Pro Arg Gly Leu Lys
885 890 895

Leu Ile Lys Ala Ile Leu Arg Pro Leu Met Leu Arg Arg Thr Lys Glu
900 905 910

Thr Arg Asp Lys Glu Gly Ser Leu Ile Leu Glu Leu Pro Pro Thr Asp
915 920 925

Val Gln Val Ile Glu Cys Glu Gln Ser Glu Ala Glu Arg Asp Phe Tyr
930 935 940

Thr Ala Leu Phe Lys Arg Ser Lys Val Gln Phe Asp Gln Phe Val Ala
945 950 955 960

Gln Gly Lys Val Leu His Asn Tyr Ala Asn Ile Leu Glu Leu Leu Leu
965 970 975

Arg Leu Arg Gln Cys Cys Asn His Pro Phe Leu Val Met Ser Arg Ala
980 985 990

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Asp Ser Gln Gln Tyr Ala Asp Leu Asp Ser Leu Ala Arg Arg Phe Leu
995 1000 1005

Asp Asn Asn Pro Asp Ser Val Ser Gln Asn Ala Pro Ser Arg Ala
1010 1015 1020

Tyr Ile Glu Glu Val Ile Gln Asp Leu Arg Asp Gly Asn Ser Lys
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Glu Cys Pro Ile Cys Leu Glu Ser Ala Asp Asp Pro Val Leu Thr
1040 1045 1050

Pro Cys Ala His Arg Met Cys Arg Glu Cys Leu Leu Thr Ser Trp
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Arg Ser Pro Ser Cys Gly Leu Cys Pro Ile Cys Arg Thr Ile Leu
1070 1075 1080

Lys Arg Thr Glu Leu Ile Ser Cys Pro Thr Asp Ser Ile Phe Arg
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Val Asp Val Val Lys Asn Trp Lys Glu Ser Ser Lys Val Ser Glu
1100 1105 1110

Leu Leu Lys Cys Leu Glu Lys Ile Lys Lys Ser Gly Ser Gly Glu
1115 1120 1125

Lys Ser Ile Val Phe Ser Gln Trp Thr Ser Phe Leu Asp Leu Leu
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1145 1150 1155

Gly Lys Leu Ala Gln Lys Gly Arg Glu Lys Val Leu Lys Glu Phe
1160 1165 1170

Asn Glu Thr Lys Gln Lys Thr Ile Leu Leu Met Ser Leu Lys Ala
1175 1180 1185

Gly Gly Val Gly Leu Asn Leu Thr Ala Ala Ser Ser Val Phe Leu
1190 1195 1200

Met Asp Pro Trp Trp Asn Pro Ala Val Glu Glu Gln Ala Ile Met

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Arg Ile  His Arg Ile Gly Gln  Lys Arg Thr Val Phe  Val Arg Arg
    1220                1225                1230

Phe Ile  Val Lys Asp Thr Val  Glu Glu Arg Met Gln  Gln Val Gln
    1235                1240                1245

Ala Arg  Lys Gln Arg Met Ile  Ala Gly Ala Leu Thr  Asp Glu Glu
    1250                1255                1260

Val Arg  Ser Ala Arg Leu Glu  Glu Leu Lys Met Leu  Phe Arg
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Ser Ser Thr Ile Ala Arg Lys Thr Trp Glu Leu Glu Asn Ser Ile Leu
5                   10                  15                  20

aca gta gac tca cct gat tca acc tcc gac aac atc ttc tac tac gac      151
Thr Val Asp Ser Pro Asp Ser Thr Ser Asp Asn Ile Phe Tyr Tyr Asp
                25                  30                  35

gat act tca cag act agg ttc cag caa gag aaa ccg tgg gag aat gat      199
Asp Thr Ser Gln Thr Arg Phe Gln Gln Glu Lys Pro Trp Glu Asn Asp
            40                  45                  50

cct cac tac ttt aaa cga gtc aag atc tca gcg ctc gct ctt ctt aag      247
Pro His Tyr Phe Lys Arg Val Lys Ile Ser Ala Leu Ala Leu Leu Lys
        55                  60                  65

atg gtg gtt cac gct cgc tct ggt ggt aca att gaa ata atg ggt ctt      295
Met Val Val His Ala Arg Ser Gly Gly Thr Ile Glu Ile Met Gly Leu
    70                  75                  80

atg caa ggt aag acc gat ggt gat act atc att gtt atg gat gct ttt      343
Met Gln Gly Lys Thr Asp Gly Asp Thr Ile Ile Val Met Asp Ala Phe
85                  90                  95                  100

gct tta cca gtg gaa ggt act gag aca agg gtt aat gct cag gat gat      391
Ala Leu Pro Val Glu Gly Thr Glu Thr Arg Val Asn Ala Gln Asp Asp
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gct tat gag tac atg gtt gag tat tca cag acc aac aag ctc gcg ggg      439
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tgc tgg ctc tcc ggt att gat gtt tct acg cag acg ctt aac caa cag      535
Cys Trp Leu Ser Gly Ile Asp Val Ser Thr Gln Thr Leu Asn Gln Gln
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cat cag gag cca ttt tta gct gtt gtt att gat ccc aca agg act gtt      583
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tca gct ggt aag gtt gag att ggt gct ttc aga aca tac tct aaa gga      631
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tat aag cct cca gat gaa cct gtt tct gag tat caa act att cct tta      679
Tyr Lys Pro Pro Asp Glu Pro Val Ser Glu Tyr Gln Thr Ile Pro Leu
            200                 205                 210

aat aag att gag gac ttt ggt gtt cac tgc aaa cag tac tat tca tta      727
Asn Lys Ile Glu Asp Phe Gly Val His Cys Lys Gln Tyr Tyr Ser Leu
        215                 220                 225

gat gtc act tat ttc aag tca tct ctt gat tct cac ctt ctg gat cta      775
Asp Val Thr Tyr Phe Lys Ser Ser Leu Asp Ser His Leu Leu Asp Leu
    230                 235                 240

cta tgg aac aag tac tgg gtg aac act ctt tct tct tct cca ctg ctg      823
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245                 250                 255                 260

ggt aat gga gac tat gtt gct gga caa ata tca gac tta gct gag aag      871
Gly Asn Gly Asp Tyr Val Ala Gly Gln Ile Ser Asp Leu Ala Glu Lys
                265                 270                 275

ctt gag caa gcc gag agt cat ctg gtt cag tct cgc ttt gga gga gtt      919
Leu Glu Gln Ala Glu Ser His Leu Val Gln Ser Arg Phe Gly Gly Val
            280                 285                 290

gtg cca tca tcc ctt cat aag aaa aaa gaa gat gag tct caa cta act      967
Val Pro Ser Ser Leu His Lys Lys Lys Glu Asp Glu Ser Gln Leu Thr
        295                 300                 305

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35 40 45

Trp Glu Asn Asp Pro His Tyr Phe Lys Arg Val Lys Ile Ser Ala Leu
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Ala Leu Leu Lys Met Val Val His Ala Arg Ser Gly Gly Thr Ile Glu
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Ile Met Gly Leu Met Gln Gly Lys Thr Asp Gly Asp Thr Ile Ile Val
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Met Asp Ala Phe Ala Leu Pro Val Glu Gly Thr Glu Thr Arg Val Asn
100 105 110

Ala Gln Asp Asp Ala Tyr Glu Tyr Met Val Glu Tyr Ser Gln Thr Asn
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Lys Leu Ala Gly Arg Leu Glu Asn Val Val Gly Trp Tyr His Ser His
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Pro Gly Tyr Gly Cys Trp Leu Ser Gly Ile Asp Val Ser Thr Gln Thr
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Thr Arg Thr Val Ser Ala Gly Lys Val Glu Ile Gly Ala Phe Arg Thr
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Tyr Ser Lys Gly Tyr Lys Pro Pro Asp Glu Pro Val Ser Glu Tyr Gln
195 200 205

Thr Ile Pro Leu Asn Lys Ile Glu Asp Phe Gly Val His Cys Lys Gln
210 215 220

Tyr Tyr Ser Leu Asp Val Thr Tyr Phe Lys Ser Ser Leu Asp Ser His
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245 250 255

Ser Pro Leu Leu Gly Asn Gly Asp Tyr Val Ala Gly Gln Ile Ser Asp
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Leu Ala Glu Lys Leu Glu Gln Ala Glu Ser His Leu Val Gln Ser Arg
275 280 285

Phe Gly Gly Val Val Pro Ser Ser Leu His Lys Lys Lys Glu Asp Glu
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Ser Gln Leu Thr Lys Ile Thr Arg Asp Ser Ala Lys Ile Thr Val Glu
305 310 315 320

Gln Val His Gly Leu Met Ser Gln Val Ile Lys Asp Glu Leu Phe Asn
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<400> 431
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Met Ala Arg Asn Ser Asn Ser Asp Glu Ala Phe Ser Ser Glu Glu Glu

```
1               5                  10                  15

gaa gag cgg gtt aag gat aat gaa gaa gaa gat gag gag gag ctc gag      96
Glu Glu Arg Val Lys Asp Asn Glu Glu Glu Asp Glu Glu Glu Leu Glu
            20                  25                  30

gct gtt gct cgt tct tct ggc tcc gac gat gac gaa gta gcc gcc gcc     144
Ala Val Ala Arg Ser Ser Gly Ser Asp Asp Asp Glu Val Ala Ala Ala
        35                  40                  45

gac gaa tca cca gtc tcc gac gga gag gct gct ccc gta gaa gat gat     192
Asp Glu Ser Pro Val Ser Asp Gly Glu Ala Ala Pro Val Glu Asp Asp
    50                  55                  60

tac gag gac gaa gaa gat gag gaa aaa gct gaa atc agc aaa cgt gag     240
Tyr Glu Asp Glu Glu Asp Glu Glu Lys Ala Glu Ile Ser Lys Arg Glu
65                  70                  75                  80

aaa gcc aga ctt aaa gag atg cag aag ttg aag aag cag aag att caa     288
Lys Ala Arg Leu Lys Glu Met Gln Lys Leu Lys Lys Gln Lys Ile Gln
                85                  90                  95

gag atg ctg gag tcg cag aat gct tcc att gac gcg gat atg aac aat     336
Glu Met Leu Glu Ser Gln Asn Ala Ser Ile Asp Ala Asp Met Asn Asn
            100                 105                 110

aag gga aaa ggg aga ctg aag tat ctt ctg cag caa act gag tta ttt     384
Lys Gly Lys Gly Arg Leu Lys Tyr Leu Leu Gln Gln Thr Glu Leu Phe
        115                 120                 125

gcc cac ttt gct aaa agt gat gga tct tct tct cag aag aag gca aaa     432
Ala His Phe Ala Lys Ser Asp Gly Ser Ser Ser Gln Lys Lys Ala Lys
    130                 135                 140

gga agg gga cgt cat gct tcc aaa ata act gaa gag gag gaa gac gaa     480
Gly Arg Gly Arg His Ala Ser Lys Ile Thr Glu Glu Glu Glu Asp Glu
145                 150                 155                 160

gag tat cta aag gaa gaa gag gat ggc tta act gga tct gga aac aca     528
Glu Tyr Leu Lys Glu Glu Glu Asp Gly Leu Thr Gly Ser Gly Asn Thr
                165                 170                 175

cgg tta ctc aca cag ccc tct tgt att caa ggg aag atg aga gat tac     576
Arg Leu Leu Thr Gln Pro Ser Cys Ile Gln Gly Lys Met Arg Asp Tyr
            180                 185                 190

caa tta gct ggt ttg aac tgg ctc att cgt ctt tat gag aat ggc ata     624
Gln Leu Ala Gly Leu Asn Trp Leu Ile Arg Leu Tyr Glu Asn Gly Ile
        195                 200                 205

aat gga att ctt gct gat gaa atg ggt ctg ggg aag acg ctt caa acg     672
Asn Gly Ile Leu Ala Asp Glu Met Gly Leu Gly Lys Thr Leu Gln Thr
    210                 215                 220

att tct ttg ttg gca tat ctt cat gaa tac agg gga atc aat ggt ccc     720
Ile Ser Leu Leu Ala Tyr Leu His Glu Tyr Arg Gly Ile Asn Gly Pro
225                 230                 235                 240
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```
cat atg gtg gtt gct cca aaa tca aca ctt ggt aat tgg atg aac gaa      768
His Met Val Val Ala Pro Lys Ser Thr Leu Gly Asn Trp Met Asn Glu
                245                 250                 255

att cgc cgg ttt tgt cct gtc cta cgt gct gtg aag ttc ctt ggt aat      816
Ile Arg Arg Phe Cys Pro Val Leu Arg Ala Val Lys Phe Leu Gly Asn
            260                 265                 270

cct gag gag agg aga cat att cga gaa gac ctg cta gtt gct ggg aaa      864
Pro Glu Glu Arg Arg His Ile Arg Glu Asp Leu Leu Val Ala Gly Lys
        275                 280                 285

ttt gat att tgt gtc aca agc ttt gag atg gcc atc aaa gag aag aca      912
Phe Asp Ile Cys Val Thr Ser Phe Glu Met Ala Ile Lys Glu Lys Thr
    290                 295                 300

gca ctt cgt cgg ttt agc tgg cgt tat att atc att gat gaa gcg cat      960
Ala Leu Arg Arg Phe Ser Trp Arg Tyr Ile Ile Ile Asp Glu Ala His
305                 310                 315                 320

cga atc aag aac gag aat tca ctc ctt tct aaa acc atg aga ctt ttt     1008
Arg Ile Lys Asn Glu Asn Ser Leu Leu Ser Lys Thr Met Arg Leu Phe
                325                 330                 335

agc acc aat tat cgg ctt ctt atc acg ggg acc ccc ctt cag aat aat     1056
Ser Thr Asn Tyr Arg Leu Leu Ile Thr Gly Thr Pro Leu Gln Asn Asn
            340                 345                 350

ctc cat gaa ctg tgg gct ctt cta aat ttt ctt ctg cct gag att ttt     1104
Leu His Glu Leu Trp Ala Leu Leu Asn Phe Leu Leu Pro Glu Ile Phe
        355                 360                 365

agt tca gca gag act ttt gat gaa tgg ttt caa att tct ggt gag aat     1152
Ser Ser Ala Glu Thr Phe Asp Glu Trp Phe Gln Ile Ser Gly Glu Asn
    370                 375                 380

gac cag caa gaa gtt gtg caa caa ctg cac aag gtt ctt cga cca ttt     1200
Asp Gln Gln Glu Val Val Gln Gln Leu His Lys Val Leu Arg Pro Phe
385                 390                 395                 400

ctt ctt cga aga cta aag tca gat gtt gag aaa ggt ttg cca ccg aag     1248
Leu Leu Arg Arg Leu Lys Ser Asp Val Glu Lys Gly Leu Pro Pro Lys
                405                 410                 415

aag gag acc ata ctt aaa gtt ggt atg tct cag atg caa aag caa tac     1296
Lys Glu Thr Ile Leu Lys Val Gly Met Ser Gln Met Gln Lys Gln Tyr
            420                 425                 430

tac aag gct tta ctg cag aag gat ctt gaa gcg gtt aat gct ggt gga     1344
Tyr Lys Ala Leu Leu Gln Lys Asp Leu Glu Ala Val Asn Ala Gly Gly
        435                 440                 445

gaa cgc aaa cgt ctg cta aac att gca atg caa ctg cgt aaa tgc tgc     1392
Glu Arg Lys Arg Leu Leu Asn Ile Ala Met Gln Leu Arg Lys Cys Cys
    450                 455                 460
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```
aat cac ccc tat ctc ttc cag ggt gca gaa cct ggt ccc cca tat acc     1440
Asn His Pro Tyr Leu Phe Gln Gly Ala Glu Pro Gly Pro Pro Tyr Thr
465                 470                 475                 480

aca gga gat cac ctt ata aca aat gct ggt aag atg gtt ctc ttg gat     1488
Thr Gly Asp His Leu Ile Thr Asn Ala Gly Lys Met Val Leu Leu Asp
                485                 490                 495

aaa ttg ctt cct aag ttg aaa gaa cgt gat tca agg gtg ctg ata ttt     1536
Lys Leu Leu Pro Lys Leu Lys Glu Arg Asp Ser Arg Val Leu Ile Phe
            500                 505                 510

tct cag atg aca aga ctt ttg gat att ctt gag gac tat tta atg tat     1584
Ser Gln Met Thr Arg Leu Leu Asp Ile Leu Glu Asp Tyr Leu Met Tyr
        515                 520                 525

cgt ggt tac ttg tat tgc cgt att gat gga aac act ggt ggt gac gaa     1632
Arg Gly Tyr Leu Tyr Cys Arg Ile Asp Gly Asn Thr Gly Gly Asp Glu
    530                 535                 540

cga gat gcc tcc ata gaa gcc tac aac aag cca gga agt gag aaa ttt     1680
Arg Asp Ala Ser Ile Glu Ala Tyr Asn Lys Pro Gly Ser Glu Lys Phe
545                 550                 555                 560

gtt ttc ttg tta tct act aga gct gga ggg ctt ggt atc aat ctt gct     1728
Val Phe Leu Leu Ser Thr Arg Ala Gly Gly Leu Gly Ile Asn Leu Ala
                565                 570                 575

act gca gat gtt gtg atc ctt tac gat agt gat tgg aac cca caa gtc     1776
Thr Ala Asp Val Val Ile Leu Tyr Asp Ser Asp Trp Asn Pro Gln Val
            580                 585                 590

gac ttg caa gct cag gat cgt gcc cat agg att ggt caa aaa aaa gaa     1824
Asp Leu Gln Ala Gln Asp Arg Ala His Arg Ile Gly Gln Lys Lys Glu
        595                 600                 605

gtt caa gtg ttt cga ttc tgc act gag tct gct att gag gag aaa gtg     1872
Val Gln Val Phe Arg Phe Cys Thr Glu Ser Ala Ile Glu Glu Lys Val
    610                 615                 620

att gaa aga gct tac aag aag tta gca ctt gat gct ctg gtt att caa     1920
Ile Glu Arg Ala Tyr Lys Lys Leu Ala Leu Asp Ala Leu Val Ile Gln
625                 630                 635                 640

caa ggg aga ttg gca gaa cag aaa agt aag tct gtc aat aag gat gag     1968
Gln Gly Arg Leu Ala Glu Gln Lys Ser Lys Ser Val Asn Lys Asp Glu
                645                 650                 655

ttg ctt caa atg gta aga tat ggt gct gag atg gtg ttc agt tct aaa     2016
Leu Leu Gln Met Val Arg Tyr Gly Ala Glu Met Val Phe Ser Ser Lys
            660                 665                 670

gat agc aca atc aca gac gag gat att gat aga atc att gcc aaa gga     2064
Asp Ser Thr Ile Thr Asp Glu Asp Ile Asp Arg Ile Ile Ala Lys Gly
        675                 680                 685

gaa gag gca aca gct gaa ctt gat gct aag atg aag aaa ttc aca gaa     2112
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Glu Glu Ala Thr Ala Glu Leu Asp Ala Lys Met Lys Lys Phe Thr Glu
    690                 695                 700

gat gct ata cag ttt aaa atg gat gac agt gct gac ttc tat gat ttt     2160
Asp Ala Ile Gln Phe Lys Met Asp Asp Ser Ala Asp Phe Tyr Asp Phe
705                 710                 715                 720

gat gat gac aat aag gat gaa aac aag ctc gat ttt aaa aag att gta     2208
Asp Asp Asp Asn Lys Asp Glu Asn Lys Leu Asp Phe Lys Lys Ile Val
                725                 730                 735

agc gac aat tgg aat gat ccc ccc aag cgg gag aga aag cgc aac tac     2256
Ser Asp Asn Trp Asn Asp Pro Pro Lys Arg Glu Arg Lys Arg Asn Tyr
            740                 745                 750

tct gaa tct gag tac ttt aag caa aca ttg cgg caa ggt gct cca gct     2304
Ser Glu Ser Glu Tyr Phe Lys Gln Thr Leu Arg Gln Gly Ala Pro Ala
        755                 760                 765

aaa cct aaa gag cct aga att ccg cgc atg ccc cag ttg cac gat ttc     2352
Lys Pro Lys Glu Pro Arg Ile Pro Arg Met Pro Gln Leu His Asp Phe
    770                 775                 780

cag ttc ttt aac att cag aga ttg acc gag ttg tat gaa aag gaa gta     2400
Gln Phe Phe Asn Ile Gln Arg Leu Thr Glu Leu Tyr Glu Lys Glu Val
785                 790                 795                 800

cgt tat ctc atg caa aca cat cag aaa aat cag ttg aaa gac aca att     2448
Arg Tyr Leu Met Gln Thr His Gln Lys Asn Gln Leu Lys Asp Thr Ile
                805                 810                 815

gat gtt gaa gaa cca gaa ggt ggg gat ccc tta act act gaa gaa gta     2496
Asp Val Glu Glu Pro Glu Gly Gly Asp Pro Leu Thr Thr Glu Glu Val
            820                 825                 830

gaa gaa aag gag gga tta ttg gag gag ggt ttc tca aca tgg agc aga     2544
Glu Glu Lys Glu Gly Leu Leu Glu Glu Gly Phe Ser Thr Trp Ser Arg
        835                 840                 845

aga gat ttt aat act ttc ctc agg gct tgt gag aag tat ggc cgc aac     2592
Arg Asp Phe Asn Thr Phe Leu Arg Ala Cys Glu Lys Tyr Gly Arg Asn
    850                 855                 860

gac ata aaa agc att gcc tct gag atg gaa ggg aaa aca gag gaa gaa     2640
Asp Ile Lys Ser Ile Ala Ser Glu Met Glu Gly Lys Thr Glu Glu Glu
865                 870                 875                 880

gtt gaa aga tat gcc aaa gta ttt aaa gag cgg tac aag gag ctg aac     2688
Val Glu Arg Tyr Ala Lys Val Phe Lys Glu Arg Tyr Lys Glu Leu Asn
                885                 890                 895

gac tat gat aga atc att aag aac att gag agg gga gag gca agg atc     2736
Asp Tyr Asp Arg Ile Ile Lys Asn Ile Glu Arg Gly Glu Ala Arg Ile
            900                 905                 910

tct agg aaa gac gaa atc atg aag gcc ata ggg aag aaa ctg gat cgc     2784
Ser Arg Lys Asp Glu Ile Met Lys Ala Ile Gly Lys Lys Leu Asp Arg
```

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        915                 920                 925

tac aga aac cct tgg ctg gaa ctg aag att caa tat ggt cag aac aaa     2832
Tyr Arg Asn Pro Trp Leu Glu Leu Lys Ile Gln Tyr Gly Gln Asn Lys
    930             935                 940

ggc aag ctg tac aat gaa gag tgt gac cgt ttc atg atc tgc atg att     2880
Gly Lys Leu Tyr Asn Glu Glu Cys Asp Arg Phe Met Ile Cys Met Ile
945                 950                 955                 960

cac aaa ctt ggt tat ggg aat tgg gat gag cta aag gca gca ttt agg     2928
His Lys Leu Gly Tyr Gly Asn Trp Asp Glu Leu Lys Ala Ala Phe Arg
                965                 970                 975

aca tcg tct gtg ttc agg ttt gac tgg ttt gtg aaa tcc cgc acg agt     2976
Thr Ser Ser Val Phe Arg Phe Asp Trp Phe Val Lys Ser Arg Thr Ser
            980                 985                 990

cag gaa ctt gca aga aga tgc gac  act ctg att cga ctg  atc gag aaa   3024
Gln Glu Leu Ala Arg Arg Cys Asp  Thr Leu Ile Arg Leu  Ile Glu Lys
        995                 1000                1005

gag aac  cag gag ttt gat gaa  aga gag agg caa gcc  cgc aaa gag      3069
Glu Asn  Gln Glu Phe Asp Glu  Arg Glu Arg Gln Ala  Arg Lys Glu
    1010                1015                1020

aag aag  ctc gcg aag agt gca  aca cca tca aag cga  cct tta gga      3114
Lys Lys  Leu Ala Lys Ser Ala  Thr Pro Ser Lys Arg  Pro Leu Gly
    1025                1030                1035

aga caa  gca agt gag agt cct  tca tcg acg aag aag  cgg aag cac      3159
Arg Gln  Ala Ser Glu Ser Pro  Ser Ser Thr Lys Lys  Arg Lys His
    1040                1045                1050

ctg tcg  atg aga tga                                               3174
Leu Ser  Met Arg
    1055
```

<210> 432 <211> 1057 <212> PRT <213> Arabidopsis thaliana <400> 432

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Met Ala Arg Asn Ser Asn Ser Asp Glu Ala Phe Ser Ser Glu Glu Glu
1               5                   10                  15

Glu Glu Arg Val Lys Asp Asn Glu Glu Glu Asp Glu Glu Glu Leu Glu
            20                  25                  30

Ala Val Ala Arg Ser Ser Gly Ser Asp Asp Asp Glu Val Ala Ala Ala
        35                  40                  45

Asp Glu Ser Pro Val Ser Asp Gly Glu Ala Ala Pro Val Glu Asp Asp
    50                  55                  60
```

Tyr Glu Asp Glu Glu Asp Glu Glu Lys Ala Glu Ile Ser Lys Arg Glu
65 70 75 80

Lys Ala Arg Leu Lys Glu Met Gln Lys Leu Lys Lys Gln Lys Ile Gln
85 90 95

Glu Met Leu Glu Ser Gln Asn Ala Ser Ile Asp Ala Asp Met Asn Asn
100 105 110

Lys Gly Lys Gly Arg Leu Lys Tyr Leu Leu Gln Gln Thr Glu Leu Phe
115 120 125

Ala His Phe Ala Lys Ser Asp Gly Ser Ser Ser Gln Lys Lys Ala Lys
130 135 140

Gly Arg Gly Arg His Ala Ser Lys Ile Thr Glu Glu Glu Glu Asp Glu
145 150 155 160

Glu Tyr Leu Lys Glu Glu Glu Asp Gly Leu Thr Gly Ser Gly Asn Thr
165 170 175

Arg Leu Leu Thr Gln Pro Ser Cys Ile Gln Gly Lys Met Arg Asp Tyr
180 185 190

Gln Leu Ala Gly Leu Asn Trp Leu Ile Arg Leu Tyr Glu Asn Gly Ile
195 200 205

Asn Gly Ile Leu Ala Asp Glu Met Gly Leu Gly Lys Thr Leu Gln Thr
210 215 220

Ile Ser Leu Leu Ala Tyr Leu His Glu Tyr Arg Gly Ile Asn Gly Pro
225 230 235 240

His Met Val Val Ala Pro Lys Ser Thr Leu Gly Asn Trp Met Asn Glu
245 250 255

Ile Arg Arg Phe Cys Pro Val Leu Arg Ala Val Lys Phe Leu Gly Asn
260 265 270

Pro Glu Glu Arg Arg His Ile Arg Glu Asp Leu Leu Val Ala Gly Lys
275 280 285

Phe Asp Ile Cys Val Thr Ser Phe Glu Met Ala Ile Lys Glu Lys Thr

290 295 300

Ala Leu Arg Arg Phe Ser Trp Arg Tyr Ile Ile Ile Asp Glu Ala His
305 310 315 320

Arg Ile Lys Asn Glu Asn Ser Leu Leu Ser Lys Thr Met Arg Leu Phe
325 330 335

Ser Thr Asn Tyr Arg Leu Leu Ile Thr Gly Thr Pro Leu Gln Asn Asn
340 345 350

Leu His Glu Leu Trp Ala Leu Leu Asn Phe Leu Leu Pro Glu Ile Phe
355 360 365

Ser Ser Ala Glu Thr Phe Asp Glu Trp Phe Gln Ile Ser Gly Glu Asn
370 375 380

Asp Gln Gln Glu Val Val Gln Gln Leu His Lys Val Leu Arg Pro Phe
385 390 395 400

Leu Leu Arg Arg Leu Lys Ser Asp Val Glu Lys Gly Leu Pro Pro Lys
405 410 415

Lys Glu Thr Ile Leu Lys Val Gly Met Ser Gln Met Gln Lys Gln Tyr
420 425 430

Tyr Lys Ala Leu Leu Gln Lys Asp Leu Glu Ala Val Asn Ala Gly Gly
435 440 445

Glu Arg Lys Arg Leu Leu Asn Ile Ala Met Gln Leu Arg Lys Cys Cys
450 455 460

Asn His Pro Tyr Leu Phe Gln Gly Ala Glu Pro Gly Pro Pro Tyr Thr
465 470 475 480

Thr Gly Asp His Leu Ile Thr Asn Ala Gly Lys Met Val Leu Leu Asp
485 490 495

Lys Leu Leu Pro Lys Leu Lys Glu Arg Asp Ser Arg Val Leu Ile Phe
500 505 510

Ser Gln Met Thr Arg Leu Leu Asp Ile Leu Glu Asp Tyr Leu Met Tyr
515 520 525

Arg Gly Tyr Leu Tyr Cys Arg Ile Asp Gly Asn Thr Gly Gly Asp Glu
530 535 540

Arg Asp Ala Ser Ile Glu Ala Tyr Asn Lys Pro Gly Ser Glu Lys Phe
545 550 555 560

Val Phe Leu Leu Ser Thr Arg Ala Gly Gly Leu Gly Ile Asn Leu Ala
565 570 575

Thr Ala Asp Val Val Ile Leu Tyr Asp Ser Asp Trp Asn Pro Gln Val
580 585 590

Asp Leu Gln Ala Gln Asp Arg Ala His Arg Ile Gly Gln Lys Lys Glu
595 600 605

Val Gln Val Phe Arg Phe Cys Thr Glu Ser Ala Ile Glu Glu Lys Val
610 615 620

Ile Glu Arg Ala Tyr Lys Lys Leu Ala Leu Asp Ala Leu Val Ile Gln
625 630 635 640

Gln Gly Arg Leu Ala Glu Gln Lys Ser Lys Ser Val Asn Lys Asp Glu
645 650 655

Leu Leu Gln Met Val Arg Tyr Gly Ala Glu Met Val Phe Ser Ser Lys
660 665 670

Asp Ser Thr Ile Thr Asp Glu Asp Ile Asp Arg Ile Ile Ala Lys Gly
675 680 685

Glu Glu Ala Thr Ala Glu Leu Asp Ala Lys Met Lys Lys Phe Thr Glu
690 695 700

Asp Ala Ile Gln Phe Lys Met Asp Asp Ser Ala Asp Phe Tyr Asp Phe
705 710 715 720

Asp Asp Asp Asn Lys Asp Glu Asn Lys Leu Asp Phe Lys Lys Ile Val
725 730 735

Ser Asp Asn Trp Asn Asp Pro Pro Lys Arg Glu Arg Lys Arg Asn Tyr
740 745 750

Ser Glu Ser Glu Tyr Phe Lys Gln Thr Leu Arg Gln Gly Ala Pro Ala
755 760 765

Lys Pro Lys Glu Pro Arg Ile Pro Arg Met Pro Gln Leu His Asp Phe
770 775 780

Gln Phe Phe Asn Ile Gln Arg Leu Thr Glu Leu Tyr Glu Lys Glu Val
785 790 795 800

Arg Tyr Leu Met Gln Thr His Gln Lys Asn Gln Leu Lys Asp Thr Ile
805 810 815

Asp Val Glu Glu Pro Glu Gly Gly Asp Pro Leu Thr Thr Glu Glu Val
820 825 830

Glu Glu Lys Glu Gly Leu Leu Glu Glu Gly Phe Ser Thr Trp Ser Arg
835 840 845

Arg Asp Phe Asn Thr Phe Leu Arg Ala Cys Glu Lys Tyr Gly Arg Asn
850 855 860

Asp Ile Lys Ser Ile Ala Ser Glu Met Glu Gly Lys Thr Glu Glu Glu
865 870 875 880

Val Glu Arg Tyr Ala Lys Val Phe Lys Glu Arg Tyr Lys Glu Leu Asn
885 890 895

Asp Tyr Asp Arg Ile Ile Lys Asn Ile Glu Arg Gly Glu Ala Arg Ile
900 905 910

Ser Arg Lys Asp Glu Ile Met Lys Ala Ile Gly Lys Lys Leu Asp Arg
915 920 925

Tyr Arg Asn Pro Trp Leu Glu Leu Lys Ile Gln Tyr Gly Gln Asn Lys
930 935 940

Gly Lys Leu Tyr Asn Glu Glu Cys Asp Arg Phe Met Ile Cys Met Ile
945 950 955 960

His Lys Leu Gly Tyr Gly Asn Trp Asp Glu Leu Lys Ala Ala Phe Arg
965 970 975

```
Thr Ser Ser Val Phe Arg Phe Asp Trp Phe Val Lys Ser Arg Thr Ser
            980                 985                 990

Gln Glu Leu Ala Arg Arg Cys Asp  Thr Leu Ile Arg Leu  Ile Glu Lys
        995                 1000                1005

Glu Asn  Gln Glu Phe Asp Glu  Arg Glu Arg Gln Ala  Arg Lys Glu
    1010                1015                1020

Lys Lys  Leu Ala Lys Ser Ala  Thr Pro Ser Lys Arg  Pro Leu Gly
    1025                1030                1035

Arg Gln  Ala Ser Glu Ser Pro  Ser Ser Thr Lys Lys  Arg Lys His
    1040                1045                1050

Leu Ser  Met Arg
    1055
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Substitute Sheet (Rule 26)

<210> 433 <211> 2083 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (54)..(1859) <223> G1290

<400> 433

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aattccactg ttattagact cttgactctg ttttgtttcc cgccgatctc gtg atg        56
                                                          Met
                                                           1

atg gcc acc acc acc acc acc acc gct aga ttc tct gat tca tac      104
Met Ala Thr Thr Thr Thr Thr Thr Ala Arg Phe Ser Asp Ser Tyr
            5                  10                  15

gag ttc agc aac aca agc ggc aat agc ttc ttc gcc gcc gag tca tct      152
Glu Phe Ser Asn Thr Ser Gly Asn Ser Phe Phe Ala Ala Glu Ser Ser
        20                  25                  30

ctt gat tat ccg acg gaa ttt ctc acg cca ccg gag gta tca gct ctt      200
Leu Asp Tyr Pro Thr Glu Phe Leu Thr Pro Pro Glu Val Ser Ala Leu
    35                  40                  45

aaa ctt ctg tct aac tgc ctc gag tct gtt ttc gac tcg ccg gag acg      248
Lys Leu Leu Ser Asn Cys Leu Glu Ser Val Phe Asp Ser Pro Glu Thr
50                  55                  60                  65

ttc tac agc gat gct aag cta gtt ctc gcc ggc ggc cgg gaa gtt tct      296
Phe Tyr Ser Asp Ala Lys Leu Val Leu Ala Gly Gly Arg Glu Val Ser
                70                  75                  80

ttt cac cgt tgt att ctt tcc gcg aga att cct gtc ttc aaa agc gct      344
Phe His Arg Cys Ile Leu Ser Ala Arg Ile Pro Val Phe Lys Ser Ala
            85                  90                  95

tta gcc acc gtg aag gaa caa aaa tcc tcc acc acc gtg aag ctc cag      392
```

```
Leu Ala Thr Val Lys Glu Gln Lys Ser Ser Thr Thr Val Lys Leu Gln
        100                 105                 110

ctg aaa gag atc gcc aga gat tac gaa gtc ggc ttt gac tcg gtt gtg      440
Leu Lys Glu Ile Ala Arg Asp Tyr Glu Val Gly Phe Asp Ser Val Val
    115                 120                 125

gcg gtt ttg gcg tat gtt tac agc ggc aga gtg agg tcc ccg ccg aag      488
Ala Val Leu Ala Tyr Val Tyr Ser Gly Arg Val Arg Ser Pro Pro Lys
130                 135                 140                 145

gga gct tct gct tgc gta gac gac gat tgt tgc cac gtg gct tgc cgg      536
Gly Ala Ser Ala Cys Val Asp Asp Asp Cys Cys His Val Ala Cys Arg
                150                 155                 160

tca aag gtg gat ttc atg gtg gag gtt ctt tat ctg tct ttc gtt ttc      584
Ser Lys Val Asp Phe Met Val Glu Val Leu Tyr Leu Ser Phe Val Phe
            165                 170                 175

cag att caa gaa tta gtt act ctg tat gag agg cag ttc ttg gaa att      632
Gln Ile Gln Glu Leu Val Thr Leu Tyr Glu Arg Gln Phe Leu Glu Ile
        180                 185                 190

gta gac aaa gtt gta gtc gaa gac atc ttg gtt ata ttc aag ctt gat      680
Val Asp Lys Val Val Val Glu Asp Ile Leu Val Ile Phe Lys Leu Asp
    195                 200                 205

act cta tgt ggt aca aca tac aag aag ctt ttg gat aga tgc ata gaa      728
Thr Leu Cys Gly Thr Thr Tyr Lys Lys Leu Leu Asp Arg Cys Ile Glu
210                 215                 220                 225

att atc gtg aag tct gat ata gaa cta gtt agt ctt gag aag tct tta      776
Ile Ile Val Lys Ser Asp Ile Glu Leu Val Ser Leu Glu Lys Ser Leu
                230                 235                 240

cct caa cac att ttc aag caa atc ata gac atc cgc gaa gcg ctc tgt      824
Pro Gln His Ile Phe Lys Gln Ile Ile Asp Ile Arg Glu Ala Leu Cys
            245                 250                 255

cta gag cca cct aaa cta gaa agg cat gtc aag aac ata tac aag gcg      872
Leu Glu Pro Pro Lys Leu Glu Arg His Val Lys Asn Ile Tyr Lys Ala
        260                 265                 270

cta gac tca gat gat gtt gag ctt gtc aag atg ctt ttg cta gaa gga      920
Leu Asp Ser Asp Asp Val Glu Leu Val Lys Met Leu Leu Leu Glu Gly
    275                 280                 285

cac acc aat ctc gat gag gcg tat gct ctt cat ttt gct atc gct cac      968
His Thr Asn Leu Asp Glu Ala Tyr Ala Leu His Phe Ala Ile Ala His
290                 295                 300                 305

tgc gct gtg aag acc gcg tat gat ctc ctc gag ctt gag ctt gcg gat     1016
Cys Ala Val Lys Thr Ala Tyr Asp Leu Leu Glu Leu Glu Leu Ala Asp
                310                 315                 320

gtt aac ctt aga aat ccg agg gga tac act gtg ctt cat gtt gct gcg     1064
Val Asn Leu Arg Asn Pro Arg Gly Tyr Thr Val Leu His Val Ala Ala
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Substitute Sheet (Rule 26)

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            325                 330                 335

atg cgg aag gag ccg aag ttg ata ata tct ttg tta atg aaa ggg gca     1112
Met Arg Lys Glu Pro Lys Leu Ile Ile Ser Leu Leu Met Lys Gly Ala
        340                 345                 350

aat att tta gac aca aca ttg gat ggt aga acc gct tta gtg att gta     1160
Asn Ile Leu Asp Thr Thr Leu Asp Gly Arg Thr Ala Leu Val Ile Val
    355                 360                 365

aaa cga ctc act aaa gcg gat gac tac aaa act agt acg gag gac ggt     1208
Lys Arg Leu Thr Lys Ala Asp Asp Tyr Lys Thr Ser Thr Glu Asp Gly
370                 375                 380                 385

acg cct tct ctg aaa ggc gga tta tgc ata gag gta ctt gag cat gaa     1256
Thr Pro Ser Leu Lys Gly Gly Leu Cys Ile Glu Val Leu Glu His Glu
                390                 395                 400

caa aaa cta gaa tat ttg tcg cct ata gag gct tca ctt tct ctt cca     1304
Gln Lys Leu Glu Tyr Leu Ser Pro Ile Glu Ala Ser Leu Ser Leu Pro
            405                 410                 415

gta act cca gag gag ttg agg atg agg ttg ctc tat tat gaa aac cga     1352
Val Thr Pro Glu Glu Leu Arg Met Arg Leu Leu Tyr Tyr Glu Asn Arg
        420                 425                 430

gtt gca ctt gct cga ctt ctc ttt cca gtg gaa act gaa act gta cag     1400
Val Ala Leu Ala Arg Leu Leu Phe Pro Val Glu Thr Glu Thr Val Gln
    435                 440                 445

ggt att gcc aaa ttg gag gaa aca tgc gag ttt aca gct tct agt ctc     1448
Gly Ile Ala Lys Leu Glu Glu Thr Cys Glu Phe Thr Ala Ser Ser Leu
450                 455                 460                 465

gag cct gat cat cac att ggt gaa aag cgg aca tca cta gac cta aat     1496
Glu Pro Asp His His Ile Gly Glu Lys Arg Thr Ser Leu Asp Leu Asn
                470                 475                 480

atg gcg ccg ttc caa atc cat gag aag cat ttg agt aga cta aga gca     1544
Met Ala Pro Phe Gln Ile His Glu Lys His Leu Ser Arg Leu Arg Ala
            485                 490                 495

ctt tgt aaa acc gtg gaa ctg ggg aaa cgc tac ttc aaa cga tgt tcg     1592
Leu Cys Lys Thr Val Glu Leu Gly Lys Arg Tyr Phe Lys Arg Cys Ser
        500                 505                 510

ctt gat cac ttt atg gat act gag gac ttg aat cat ctt gct agc gta     1640
Leu Asp His Phe Met Asp Thr Glu Asp Leu Asn His Leu Ala Ser Val
    515                 520                 525

gaa gaa gat act cct gag aaa cgg cta caa aag aag caa agg tac atg     1688
Glu Glu Asp Thr Pro Glu Lys Arg Leu Gln Lys Lys Gln Arg Tyr Met
530                 535                 540                 545

gaa cta caa gag act ctg atg aag acc ttt agt gag gac aag gag gaa     1736
Glu Leu Gln Glu Thr Leu Met Lys Thr Phe Ser Glu Asp Lys Glu Glu
                550                 555                 560
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tgt gga aag tct tcc aca ccg aaa cca acc tct gcg gtg agg tct aat 1784
Cys Gly Lys Ser Ser Thr Pro Lys Pro Thr Ser Ala Val Arg Ser Asn
565 570 575

aga aaa ctc tct cac cgg cgc cta aaa gtg gac aaa cgg gat ttt ttg 1832
Arg Lys Leu Ser His Arg Arg Leu Lys Val Asp Lys Arg Asp Phe Leu
580 585 590

aaa cga cct tac ggg aac ggg gat taa ggaatgggaa atcatattcc 1879
Lys Arg Pro Tyr Gly Asn Gly Asp
595 600

atttcactcc cacaactaaa aatgatgtat gtcctatatc atgatgtttc gtgagtttca 1939

aataaattga aacgtacata tatcagtttt tcatctacgt gactgcgttg tatagttttc 1999

gttcttcact tagcatcatg tgtattctag ctccaagtgc gtttcaaaca aatatagtta 2059

tttttagcca attatatata cggt 2083

<210> 434 <211> 601 <212> PRT <213> Arabidopsis thaliana <400> 434

Met Met Ala Thr Thr Thr Thr Thr Thr Ala Arg Phe Ser Asp Ser
1 5 10 15

Tyr Glu Phe Ser Asn Thr Ser Gly Asn Ser Phe Phe Ala Ala Glu Ser
20 25 30

Ser Leu Asp Tyr Pro Thr Glu Phe Leu Thr Pro Pro Glu Val Ser Ala
35 40 45

Leu Lys Leu Leu Ser Asn Cys Leu Glu Ser Val Phe Asp Ser Pro Glu
50 55 60

Thr Phe Tyr Ser Asp Ala Lys Leu Val Leu Ala Gly Gly Arg Glu Val
65 70 75 80

Ser Phe His Arg Cys Ile Leu Ser Ala Arg Ile Pro Val Phe Lys Ser
85 90 95

Ala Leu Ala Thr Val Lys Glu Gln Lys Ser Ser Thr Thr Val Lys Leu
100 105 110

Gln Leu Lys Glu Ile Ala Arg Asp Tyr Glu Val Gly Phe Asp Ser Val
115 120 125

Val Ala Val Leu Ala Tyr Val Tyr Ser Gly Arg Val Arg Ser Pro Pro

130 135 140

Lys Gly Ala Ser Ala Cys Val Asp Asp Asp Cys Cys His Val Ala Cys
145 150 155 160

Arg Ser Lys Val Asp Phe Met Val Glu Val Leu Tyr Leu Ser Phe Val
165 170 175

Phe Gln Ile Gln Glu Leu Val Thr Leu Tyr Glu Arg Gln Phe Leu Glu
180 185 190

Ile Val Asp Lys Val Val Val Glu Asp Ile Leu Val Ile Phe Lys Leu
195 200 205

Asp Thr Leu Cys Gly Thr Thr Tyr Lys Lys Leu Leu Asp Arg Cys Ile
210 215 220

Glu Ile Ile Val Lys Ser Asp Ile Glu Leu Val Ser Leu Glu Lys Ser
225 230 235 240

Leu Pro Gln His Ile Phe Lys Gln Ile Ile Asp Ile Arg Glu Ala Leu
245 250 255

Cys Leu Glu Pro Pro Lys Leu Glu Arg His Val Lys Asn Ile Tyr Lys
260 265 270

Ala Leu Asp Ser Asp Asp Val Glu Leu Val Lys Met Leu Leu Leu Glu
275 280 285

Gly His Thr Asn Leu Asp Glu Ala Tyr Ala Leu His Phe Ala Ile Ala
290 295 300

His Cys Ala Val Lys Thr Ala Tyr Asp Leu Leu Glu Leu Glu Leu Ala
305 310 315 320

Asp Val Asn Leu Arg Asn Pro Arg Gly Tyr Thr Val Leu His Val Ala
325 330 335

Ala Met Arg Lys Glu Pro Lys Leu Ile Ile Ser Leu Leu Met Lys Gly
340 345 350

Ala Asn Ile Leu Asp Thr Thr Leu Asp Gly Arg Thr Ala Leu Val Ile
355 360 365

Val Lys Arg Leu Thr Lys Ala Asp Asp Tyr Lys Thr Ser Thr Glu Asp
370 375 380

Gly Thr Pro Ser Leu Lys Gly Gly Leu Cys Ile Glu Val Leu Glu His
385 390 395 400

Glu Gln Lys Leu Glu Tyr Leu Ser Pro Ile Glu Ala Ser Leu Ser Leu
405 410 415

Pro Val Thr Pro Glu Glu Leu Arg Met Arg Leu Leu Tyr Tyr Glu Asn
420 425 430

Arg Val Ala Leu Ala Arg Leu Leu Phe Pro Val Glu Thr Glu Thr Val
435 440 445

Gln Gly Ile Ala Lys Leu Glu Glu Thr Cys Glu Phe Thr Ala Ser Ser
450 455 460

Leu Glu Pro Asp His His Ile Gly Glu Lys Arg Thr Ser Leu Asp Leu
465 470 475 480

Asn Met Ala Pro Phe Gln Ile His Glu Lys His Leu Ser Arg Leu Arg
485 490 495

Ala Leu Cys Lys Thr Val Glu Leu Gly Lys Arg Tyr Phe Lys Arg Cys
500 505 510

Ser Leu Asp His Phe Met Asp Thr Glu Asp Leu Asn His Leu Ala Ser
515 520 525

Val Glu Glu Asp Thr Pro Glu Lys Arg Leu Gln Lys Lys Gln Arg Tyr
530 535 540

Met Glu Leu Gln Glu Thr Leu Met Lys Thr Phe Ser Glu Asp Lys Glu
545 550 555 560

Glu Cys Gly Lys Ser Ser Thr Pro Lys Pro Thr Ser Ala Val Arg Ser
565 570 575

Asn Arg Lys Leu Ser His Arg Arg Leu Lys Val Asp Lys Arg Asp Phe
580 585 590

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Leu Lys Arg Pro Tyr Gly Asn Gly Asp
        595                 600


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<222>  (39)..(788) <223>  G1320

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gaagatcata aagatcaaaa ggagagaggt attaaaaa atg atg tgt agt cga ggc     56
                                        Met Met Cys Ser Arg Gly
                                        1               5

cat tgg aga cct gca gaa gac gag aag cta aga gaa ctc gtc gag caa      104
His Trp Arg Pro Ala Glu Asp Glu Lys Leu Arg Glu Leu Val Glu Gln
            10                  15                  20

ttt ggt cct cat aat tgg aac gcc ata gct cag aag ctc tct ggt cga      152
Phe Gly Pro His Asn Trp Asn Ala Ile Ala Gln Lys Leu Ser Gly Arg
        25                  30                  35

tct ggt aag agt tgt aga ttg aga tgg ttt aat caa ttg gat cct agg      200
Ser Gly Lys Ser Cys Arg Leu Arg Trp Phe Asn Gln Leu Asp Pro Arg
    40                  45                  50

att aac cga aac cct ttc acg gag gaa gaa gaa gaa agg ctt tta gcg      248
Ile Asn Arg Asn Pro Phe Thr Glu Glu Glu Glu Glu Arg Leu Leu Ala
55                  60                  65                  70

cct cat cgg atc cat ggg aac aga tgg tct gtg atc gct aga ttt ttt      296
Pro His Arg Ile His Gly Asn Arg Trp Ser Val Ile Ala Arg Phe Phe
                75                  80                  85

ccc ggt cga act gat aac gct gtt aaa aac cat tgg cac gtc atc atg      344
Pro Gly Arg Thr Asp Asn Ala Val Lys Asn His Trp His Val Ile Met
            90                  95                  100

gct cgt cgt ggc cga gaa cgg tcc aag ctc cgt cca cga ggc ctt ggc      392
Ala Arg Arg Gly Arg Glu Arg Ser Lys Leu Arg Pro Arg Gly Leu Gly
        105                 110                 115

cat gat ggc acg gtg gct gcg act ggg atg att ggt aat tat aaa gac      440
His Asp Gly Thr Val Ala Ala Thr Gly Met Ile Gly Asn Tyr Lys Asp
    120                 125                 130

tgc gat aag gag aga aga ttg gca acc aca acc gct atc aat ttt cct      488
Cys Asp Lys Glu Arg Arg Leu Ala Thr Thr Thr Ala Ile Asn Phe Pro
135                 140                 145                 150

tat caa ttc tct cat att aat cat ttt caa gtc ctc aaa gag tcc ttg      536
Tyr Gln Phe Ser His Ile Asn His Phe Gln Val Leu Lys Glu Ser Leu
                155                 160                 165

acc gga aag atc ggg ttc aga aat agt act act cca ata caa gaa gga      584
Thr Gly Lys Ile Gly Phe Arg Asn Ser Thr Thr Pro Ile Gln Glu Gly
            170                 175                 180
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gca ata gac caa act aaa cga ccg atg gag ttc tac aat ttt ctc caa 632
Ala Ile Asp Gln Thr Lys Arg Pro Met Glu Phe Tyr Asn Phe Leu Gln
185 190 195

gta aac acg gat tcg aag ata cac gaa ttg ata gat aat tca aga aaa 680
Val Asn Thr Asp Ser Lys Ile His Glu Leu Ile Asp Asn Ser Arg Lys
200 205 210

gac gaa gaa gaa gat gtc gat caa aac aac cga att cgt aac gag aat 728
Asp Glu Glu Glu Asp Val Asp Gln Asn Asn Arg Ile Arg Asn Glu Asn
215 220 225 230

tgt gtt cca ttt ttc gac ttt ttg tct gtt gga aac tct gcc tct cag 776
Cys Val Pro Phe Phe Asp Phe Leu Ser Val Gly Asn Ser Ala Ser Gln
235 240 245

ggt tta tgt taa tttgtccgta ccacatgtac tataaggtgg accatatgtt 828
Gly Leu Cys

aactaaagat aatgtagaaa gtactaatca attagagctc ctgtttgagc caaatgtgaa 888

aattagttaa gacatcccaa acattttctt gtataacaca tataaggttg tacttttatc 948

aggtctaatt ttctattttt attttaagga tgtttaatca gacccataac cattcgataa 1008

aaaaaaaaaa aa 1020

<210> 436 <211> 249 <212> PRT <213> Arabidopsis thaliana <400> 436

Met Met Cys Ser Arg Gly His Trp Arg Pro Ala Glu Asp Glu Lys Leu
1 5 10 15

Arg Glu Leu Val Glu Gln Phe Gly Pro His Asn Trp Asn Ala Ile Ala
20 25 30

Gln Lys Leu Ser Gly Arg Ser Gly Lys Ser Cys Arg Leu Arg Trp Phe
35 40 45

Asn Gln Leu Asp Pro Arg Ile Asn Arg Asn Pro Phe Thr Glu Glu Glu
50 55 60

Glu Glu Arg Leu Leu Ala Pro His Arg Ile His Gly Asn Arg Trp Ser
65 70 75 80

Val Ile Ala Arg Phe Phe Pro Gly Arg Thr Asp Asn Ala Val Lys Asn
85 90 95

His Trp His Val Ile Met Ala Arg Arg Gly Arg Glu Arg Ser Lys Leu
100 105 110

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Arg Pro Arg Gly Leu Gly His Asp Gly Thr Val Ala Ala Thr Gly Met
        115                 120                 125

Ile Gly Asn Tyr Lys Asp Cys Asp Lys Glu Arg Arg Leu Ala Thr Thr
    130                 135                 140

Thr Ala Ile Asn Phe Pro Tyr Gln Phe Ser His Ile Asn His Phe Gln
145                 150                 155                 160

Val Leu Lys Glu Ser Leu Thr Gly Lys Ile Gly Phe Arg Asn Ser Thr
                165                 170                 175

Thr Pro Ile Gln Glu Gly Ala Ile Asp Gln Thr Lys Arg Pro Met Glu
            180                 185                 190

Phe Tyr Asn Phe Leu Gln Val Asn Thr Asp Ser Lys Ile His Glu Leu
        195                 200                 205

Ile Asp Asn Ser Arg Lys Asp Glu Glu Glu Asp Val Asp Gln Asn Asn
    210                 215                 220

Arg Ile Arg Asn Glu Asn Cys Val Pro Phe Phe Asp Phe Leu Ser Val
225                 230                 235                 240

Gly Asn Ser Ala Ser Gln Gly Leu Cys
                245
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<210> 437 <211> 925 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (59)..(697) <223> G1329

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ccacgcgtcc gtacctttta caatttgttt atatatttta cgtatctatc tttgttcc        58

atg gag ggt tcg tcc aaa ggg ctg cga aaa ggt gct tgg act act gaa       106
Met Glu Gly Ser Ser Lys Gly Leu Arg Lys Gly Ala Trp Thr Thr Glu
1               5                   10                  15

gaa gat agt ctc ttg aga cag tgc att aat aag tat gga gaa ggc aaa       154
Glu Asp Ser Leu Leu Arg Gln Cys Ile Asn Lys Tyr Gly Glu Gly Lys
            20                  25                  30

tgg cac caa gtt cct gta aga gct ggg cta aac cgg tgc agg aaa agt       202
Trp His Gln Val Pro Val Arg Ala Gly Leu Asn Arg Cys Arg Lys Ser
        35                  40                  45

tgt aga tta aga tgg ttg aac tat ttg aag cca agt atc aag aga gga       250
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Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
    50                  55                  60

aaa ctt agc tct gat gaa gtc gat ctt ctt ctt cgc ctt cat agg ctt      298
Lys Leu Ser Ser Asp Glu Val Asp Leu Leu Leu Arg Leu His Arg Leu
65                  70                  75                  80

cta ggg aat agg tgg tct tta att gct gga aga tta cct ggt cgg acc      346
Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
                85                  90                  95

gca aat gac gtc aag aat tac tgg aac act cat ctg agt aag aaa cat      394
Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
            100                 105                 110

gaa ccg tgt tgt aag ata aag atg aaa aag aga gac att acg ccc att      442
Glu Pro Cys Cys Lys Ile Lys Met Lys Lys Arg Asp Ile Thr Pro Ile
        115                 120                 125

cct aca aca ccg gca cta aaa aac aat gtt tat aag cct cga cct cga      490
Pro Thr Thr Pro Ala Leu Lys Asn Asn Val Tyr Lys Pro Arg Pro Arg
    130                 135                 140

tcc ttc aca gtt aac aac gac tgc aac cat ctc aat gcc cca cca aaa      538
Ser Phe Thr Val Asn Asn Asp Cys Asn His Leu Asn Ala Pro Pro Lys
145                 150                 155                 160

gtt gac gtt aat cct cca tgc ctt gga ctt aac atc aat aat gtt tgt      586
Val Asp Val Asn Pro Pro Cys Leu Gly Leu Asn Ile Asn Asn Val Cys
                165                 170                 175

gac aat agt atc ata tac aac aaa gat aag aag aaa gac caa cta gtg      634
Asp Asn Ser Ile Ile Tyr Asn Lys Asp Lys Lys Lys Asp Gln Leu Val
            180                 185                 190

aat aat ttg att gat gga gat aat atg tgg tta gag aaa ttc cta agg      682
Asn Asn Leu Ile Asp Gly Asp Asn Met Trp Leu Glu Lys Phe Leu Arg
        195                 200                 205

aaa gcc aag agg tag atattttggt tcctgaagcg acgacaacag aaaaggggga      737
Lys Ala Lys Arg
    210

caccttggct tttgacgttg atcaactttg gagtcttttc gatggagaga ctgtgaaatt    797

tgattagtgt ttcgaacatt tgtttgcgtt tgtgtatagg tttgctttca ccttttaatt    857

tgtgtgtttt gataaataag ctaatagttt ttagcatttt aatgaaatat ttcaagtttc    917

cgtgttac                                                            925

<210>  438 <211>  212 <212>  PRT <213>  Arabidopsis thaliana  <400>  438

Met Glu Gly Ser Ser Lys Gly Leu Arg Lys Gly Ala Trp Thr Thr Glu
1               5                   10                  15
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Glu Asp Ser Leu Leu Arg Gln Cys Ile Asn Lys Tyr Gly Glu Gly Lys
20 25 30

Trp His Gln Val Pro Val Arg Ala Gly Leu Asn Arg Cys Arg Lys Ser
35 40 45

Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
50 55 60

Lys Leu Ser Ser Asp Glu Val Asp Leu Leu Leu Arg Leu His Arg Leu
65 70 75 80

Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
85 90 95

Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
100 105 110

Glu Pro Cys Cys Lys Ile Lys Met Lys Lys Arg Asp Ile Thr Pro Ile
115 120 125

Pro Thr Thr Pro Ala Leu Lys Asn Asn Val Tyr Lys Pro Arg Pro Arg
130 135 140

Ser Phe Thr Val Asn Asn Asp Cys Asn His Leu Asn Ala Pro Pro Lys
145 150 155 160

Val Asp Val Asn Pro Pro Cys Leu Gly Leu Asn Ile Asn Asn Val Cys
165 170 175

Asp Asn Ser Ile Ile Tyr Asn Lys Asp Lys Lys Lys Asp Gln Leu Val
180 185 190

Asn Asn Leu Ile Asp Gly Asp Asn Met Trp Leu Glu Lys Phe Leu Arg
195 200 205

Lys Ala Lys Arg
210

<210> 439 <211> 1989 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (8)..(1966) <223> G1455

<400> 439

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cgtcgac atg aac caa ata aaa aac aaa act tta ccg gag atg acg acg        49
        Met Asn Gln Ile Lys Asn Lys Thr Leu Pro Glu Met Thr Thr
        1               5                   10

gag caa gct ttg ttg tct atg gaa gct tta cct tta ggt ttc aga ttc        97
Glu Gln Ala Leu Leu Ser Met Glu Ala Leu Pro Leu Gly Phe Arg Phe
15                  20                  25                  30

aga cca acg gat gaa gaa ctc atc aat cat tac cta agg tta aaa atc       145
Arg Pro Thr Asp Glu Glu Leu Ile Asn His Tyr Leu Arg Leu Lys Ile
                35                  40                  45

aac ggc cgt gat tta gag gtt aga gtc atc cct gag atc gat gtt tgc       193
Asn Gly Arg Asp Leu Glu Val Arg Val Ile Pro Glu Ile Asp Val Cys
            50                  55                  60

aag tgg gaa cca tgg gac tta cct ggg cta tcg gtg ata aag aca gat       241
Lys Trp Glu Pro Trp Asp Leu Pro Gly Leu Ser Val Ile Lys Thr Asp
        65                  70                  75

gat caa gaa tgg ttc ttt ttt tgt cct cgt gat cga aag tat ccg agt       289
Asp Gln Glu Trp Phe Phe Phe Cys Pro Arg Asp Arg Lys Tyr Pro Ser
    80                  85                  90

ggt cat cgt tct aat aga gct act gat att ggt tac tgg aaa gct act       337
Gly His Arg Ser Asn Arg Ala Thr Asp Ile Gly Tyr Trp Lys Ala Thr
95                  100                 105                 110

ggg aaa gat cga act att aag tct aag aag atg att att ggt atg aag       385
Gly Lys Asp Arg Thr Ile Lys Ser Lys Lys Met Ile Ile Gly Met Lys
                115                 120                 125

aag act ctt gtt ttc tat cgt gga aga gct cct aga gga gag cgt act       433
Lys Thr Leu Val Phe Tyr Arg Gly Arg Ala Pro Arg Gly Glu Arg Thr
            130                 135                 140

aat tgg att atg cat gag tat cgt gct aca gac aag gaa cta gat ggt       481
Asn Trp Ile Met His Glu Tyr Arg Ala Thr Asp Lys Glu Leu Asp Gly
        145                 150                 155

act gga cct ggt cag aat ccg tat gtt ttg tgt cgc ttg ttc cac aag       529
Thr Gly Pro Gly Gln Asn Pro Tyr Val Leu Cys Arg Leu Phe His Lys
    160                 165                 170

cct agt gat agt tgt gat cct gca cac tgt gag gaa ata gag aaa gtt       577
Pro Ser Asp Ser Cys Asp Pro Ala His Cys Glu Glu Ile Glu Lys Val
175                 180                 185                 190

aat ttt act cca acc acc acc act aga tgc tct cct gat gac aca tct       625
Asn Phe Thr Pro Thr Thr Thr Thr Arg Cys Ser Pro Asp Asp Thr Ser
                195                 200                 205

tct gaa atg gtc caa gaa aca gct aca tct ggt gta cat gct cta gat       673
Ser Glu Met Val Gln Glu Thr Ala Thr Ser Gly Val His Ala Leu Asp
            210                 215                 220

aga tca gat gac act gag agg tgt tta agt gac aag ggc aat aat gat       721
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Arg Ser Asp Asp Thr Glu Arg Cys Leu Ser Asp Lys Gly Asn Asn Asp
        225                 230                 235

gtg aaa cct gat gtt tca gtg ata aac aat act tct gtc aat cac gct      769
Val Lys Pro Asp Val Ser Val Ile Asn Asn Thr Ser Val Asn His Ala
    240                 245                 250

gaa act tct cgt gcc aaa gac cgt aat ttg ggc aag acg tta gta gag      817
Glu Thr Ser Arg Ala Lys Asp Arg Asn Leu Gly Lys Thr Leu Val Glu
255                 260                 265                 270

gaa aat cca ctt cta agg gac gtt cca act ctt cat gga ccc atc ttg      865
Glu Asn Pro Leu Leu Arg Asp Val Pro Thr Leu His Gly Pro Ile Leu
                275                 280                 285

agt gag aaa tca tat tat cca gga cag tca agc atc ggt ttt gct aca      913
Ser Glu Lys Ser Tyr Tyr Pro Gly Gln Ser Ser Ile Gly Phe Ala Thr
            290                 295                 300

tct cac atg gat tct atg tat tct agt gat ttt gga aac tgt gat tat      961
Ser His Met Asp Ser Met Tyr Ser Ser Asp Phe Gly Asn Cys Asp Tyr
        305                 310                 315

ggg cta cat ttt caa gat ggt gcc tct gaa caa gat gca tct tta aca     1009
Gly Leu His Phe Gln Asp Gly Ala Ser Glu Gln Asp Ala Ser Leu Thr
    320                 325                 330

gat gtc ttg gat gaa gta ttc cat aac cat aat gaa tcc tct aat gac     1057
Asp Val Leu Asp Glu Val Phe His Asn His Asn Glu Ser Ser Asn Asp
335                 340                 345                 350

agg aaa gac ttt gta ctt ccg aat atg atg cat tgg cct ggt aat aca     1105
Arg Lys Asp Phe Val Leu Pro Asn Met Met His Trp Pro Gly Asn Thr
                355                 360                 365

aga ctg ttg tct act gag tac cca ttt ctc aaa gat tct gtt gct ttt     1153
Arg Leu Leu Ser Thr Glu Tyr Pro Phe Leu Lys Asp Ser Val Ala Phe
            370                 375                 380

gtt gac ggc agt gct gaa gtt tcc ggc tca cag caa ttt gtt cct gac     1201
Val Asp Gly Ser Ala Glu Val Ser Gly Ser Gln Gln Phe Val Pro Asp
        385                 390                 395

att tta gct tct aga tgg gtc agt gaa cag aac gtt gat agc aag gag     1249
Ile Leu Ala Ser Arg Trp Val Ser Glu Gln Asn Val Asp Ser Lys Glu
    400                 405                 410

gca gta gag att cta tct tca acc ggg tcc tct cgg acc ttg acg cca     1297
Ala Val Glu Ile Leu Ser Ser Thr Gly Ser Ser Arg Thr Leu Thr Pro
415                 420                 425                 430

ctt cat aac aac gtt ttt ggg caa tat gct tca tcg tct tac gca gct     1345
Leu His Asn Asn Val Phe Gly Gln Tyr Ala Ser Ser Ser Tyr Ala Ala
                435                 440                 445

atc gat cca ttt aac tat aat gtc aat cag cct gaa cag tca tcc ttt     1393
Ile Asp Pro Phe Asn Tyr Asn Val Asn Gln Pro Glu Gln Ser Ser Phe
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            450                 455                 460

gag caa agc cat gtt gac cgc aac att agt ccc agt aac att ttt gag     1441
Glu Gln Ser His Val Asp Arg Asn Ile Ser Pro Ser Asn Ile Phe Glu
        465                 470                 475

ttc aag gct agg tct cga gag aat cag aga gat ctg gac tct gtt gtg     1489
Phe Lys Ala Arg Ser Arg Glu Asn Gln Arg Asp Leu Asp Ser Val Val
    480                 485                 490

gac caa ggc act gct cct aga aga att cgg ctg cag atc gaa cag cca     1537
Asp Gln Gly Thr Ala Pro Arg Arg Ile Arg Leu Gln Ile Glu Gln Pro
495                 500                 505                 510

ttg acg cca gtt acc aac aag aaa gag aga gat gcg gac aac tat gaa     1585
Leu Thr Pro Val Thr Asn Lys Lys Glu Arg Asp Ala Asp Asn Tyr Glu
                515                 520                 525

gaa gaa gat gaa gta caa tct gcc atg tcc aag gtc gta gag gaa gaa     1633
Glu Glu Asp Glu Val Gln Ser Ala Met Ser Lys Val Val Glu Glu Glu
            530                 535                 540

ccg gct aat tta agt gct cag ggg act gct cag agg aga atc cgc ctg     1681
Pro Ala Asn Leu Ser Ala Gln Gly Thr Ala Gln Arg Arg Ile Arg Leu
        545                 550                 555

cag acg aga ttg agg aag cct ctc ata acc cta aac aat aca aaa aga     1729
Gln Thr Arg Leu Arg Lys Pro Leu Ile Thr Leu Asn Asn Thr Lys Arg
    560                 565                 570

aac tca aat ggc aga gaa gga gaa gca agc cat agg aag tgt gaa atg     1777
Asn Ser Asn Gly Arg Glu Gly Glu Ala Ser His Arg Lys Cys Glu Met
575                 580                 585                 590

cag gaa aaa gaa gat ata tca tca tca tca tca tgg cag aaa cag aag     1825
Gln Glu Lys Glu Asp Ile Ser Ser Ser Ser Ser Trp Gln Lys Gln Lys
                595                 600                 605

aag agc ttg gtg cag ttt agt agt gtg gtg ata ata gtg gcg gtg ata     1873
Lys Ser Leu Val Gln Phe Ser Ser Val Val Ile Ile Val Ala Val Ile
            610                 615                 620

gtt gtt tta gta gaa ata tgg aaa gag tca aga gat gcg aaa tgt agc     1921
Val Val Leu Val Glu Ile Trp Lys Glu Ser Arg Asp Ala Lys Cys Ser
        625                 630                 635

ttc ttg ttt cat caa tta gat tcc ttc aaa ggc atg ttt act tga         1966
Phe Leu Phe His Gln Leu Asp Ser Phe Lys Gly Met Phe Thr
    640                 645                 650

tgatatattg tgccgcggcc gct                                          1989


<210>  440 <211>  652 <212>  PRT <213>  Arabidopsis thaliana  <400>  440

Met Asn Gln Ile Lys Asn Lys Thr Leu Pro Glu Met Thr Thr Glu Gln
1               5                   10                  15
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Ala Leu Leu Ser Met Glu Ala Leu Pro Leu Gly Phe Arg Phe Arg Pro
20 25 30

Thr Asp Glu Glu Leu Ile Asn His Tyr Leu Arg Leu Lys Ile Asn Gly
35 40 45

Arg Asp Leu Glu Val Arg Val Ile Pro Glu Ile Asp Val Cys Lys Trp
50 55 60

Glu Pro Trp Asp Leu Pro Gly Leu Ser Val Ile Lys Thr Asp Asp Gln
65 70 75 80

Glu Trp Phe Phe Phe Cys Pro Arg Asp Arg Lys Tyr Pro Ser Gly His
85 90 95

Arg Ser Asn Arg Ala Thr Asp Ile Gly Tyr Trp Lys Ala Thr Gly Lys
100 105 110

Asp Arg Thr Ile Lys Ser Lys Lys Met Ile Ile Gly Met Lys Lys Thr
115 120 125

Leu Val Phe Tyr Arg Gly Arg Ala Pro Arg Gly Glu Arg Thr Asn Trp
130 135 140

Ile Met His Glu Tyr Arg Ala Thr Asp Lys Glu Leu Asp Gly Thr Gly
145 150 155 160

Pro Gly Gln Asn Pro Tyr Val Leu Cys Arg Leu Phe His Lys Pro Ser
165 170 175

Asp Ser Cys Asp Pro Ala His Cys Glu Glu Ile Glu Lys Val Asn Phe
180 185 190

Thr Pro Thr Thr Thr Thr Arg Cys Ser Pro Asp Asp Thr Ser Ser Glu
195 200 205

Met Val Gln Glu Thr Ala Thr Ser Gly Val His Ala Leu Asp Arg Ser
210 215 220

Asp Asp Thr Glu Arg Cys Leu Ser Asp Lys Gly Asn Asn Asp Val Lys
225 230 235 240

Pro Asp Val Ser Val Ile Asn Asn Thr Ser Val Asn His Ala Glu Thr
245 250 255

Ser Arg Ala Lys Asp Arg Asn Leu Gly Lys Thr Leu Val Glu Glu Asn
260 265 270

Pro Leu Leu Arg Asp Val Pro Thr Leu His Gly Pro Ile Leu Ser Glu
275 280 285

Lys Ser Tyr Tyr Pro Gly Gln Ser Ser Ile Gly Phe Ala Thr Ser His
290 295 300

Met Asp Ser Met Tyr Ser Ser Asp Phe Gly Asn Cys Asp Tyr Gly Leu
305 310 315 320

His Phe Gln Asp Gly Ala Ser Glu Gln Asp Ala Ser Leu Thr Asp Val
325 330 335

Leu Asp Glu Val Phe His Asn His Asn Glu Ser Ser Asn Asp Arg Lys
340 345 350

Asp Phe Val Leu Pro Asn Met Met His Trp Pro Gly Asn Thr Arg Leu
355 360 365

Leu Ser Thr Glu Tyr Pro Phe Leu Lys Asp Ser Val Ala Phe Val Asp
370 375 380

Gly Ser Ala Glu Val Ser Gly Ser Gln Gln Phe Val Pro Asp Ile Leu
385 390 395 400

Ala Ser Arg Trp Val Ser Glu Gln Asn Val Asp Ser Lys Glu Ala Val
405 410 415

Glu Ile Leu Ser Ser Thr Gly Ser Ser Arg Thr Leu Thr Pro Leu His
420 425 430

Asn Asn Val Phe Gly Gln Tyr Ala Ser Ser Ser Tyr Ala Ala Ile Asp
435 440 445

Pro Phe Asn Tyr Asn Val Asn Gln Pro Glu Gln Ser Ser Phe Glu Gln
450 455 460

Ser His Val Asp Arg Asn Ile Ser Pro Ser Asn Ile Phe Glu Phe Lys
465 470 475 480

Ala Arg Ser Arg Glu Asn Gln Arg Asp Leu Asp Ser Val Val Asp Gln
485 490 495

Gly Thr Ala Pro Arg Arg Ile Arg Leu Gln Ile Glu Gln Pro Leu Thr
500 505 510

Pro Val Thr Asn Lys Lys Glu Arg Asp Ala Asp Asn Tyr Glu Glu Glu
515 520 525

Asp Glu Val Gln Ser Ala Met Ser Lys Val Val Glu Glu Glu Pro Ala
530 535 540

Asn Leu Ser Ala Gln Gly Thr Ala Gln Arg Arg Ile Arg Leu Gln Thr
545 550 555 560

Arg Leu Arg Lys Pro Leu Ile Thr Leu Asn Asn Thr Lys Arg Asn Ser
565 570 575

Asn Gly Arg Glu Gly Glu Ala Ser His Arg Lys Cys Glu Met Gln Glu
580 585 590

Lys Glu Asp Ile Ser Ser Ser Ser Ser Trp Gln Lys Gln Lys Lys Ser
595 600 605

Leu Val Gln Phe Ser Ser Val Val Ile Ile Val Ala Val Ile Val Val
610 615 620

Leu Val Glu Ile Trp Lys Glu Ser Arg Asp Ala Lys Cys Ser Phe Leu
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Phe His Gln Leu Asp Ser Phe Lys Gly Met Phe Thr
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1 5 10 15

aac gac aac gaa aac aac aac aac aac aac aac aat ggt gga act gac 96

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Asn Asp Asn Glu Asn Asn Asn Asn Asn Asn Asn Asn Gly Gly Thr Asp
            20                  25                  30

aac act aat gct gga aat gat tct gga gat caa gat ttc gac agt ggg      144
Asn Thr Asn Ala Gly Asn Asp Ser Gly Asp Gln Asp Phe Asp Ser Gly
        35                  40                  45

aat acc tca agt ggc aat cat gga gaa ggg ttg gga aac aat caa gct      192
Asn Thr Ser Ser Gly Asn His Gly Glu Gly Leu Gly Asn Asn Gln Ala
    50                  55                  60

cct cgt cat aag aag aaa aaa tac aat cgt cac acc caa ctt cag att      240
Pro Arg His Lys Lys Lys Lys Tyr Asn Arg His Thr Gln Leu Gln Ile
65                  70                  75                  80

tcg gag atg gaa gct ttc ttc aga gag tgt cct cac cca gat gac aaa      288
Ser Glu Met Glu Ala Phe Phe Arg Glu Cys Pro His Pro Asp Asp Lys
                85                  90                  95

caa agg tac gac ctt agc gct caa ttg gga ttg gac cct gtt cag atc      336
Gln Arg Tyr Asp Leu Ser Ala Gln Leu Gly Leu Asp Pro Val Gln Ile
            100                 105                 110

aaa ttc tgg ttc cag aac aaa cgc act caa aac aag aat caa caa gaa      384
Lys Phe Trp Phe Gln Asn Lys Arg Thr Gln Asn Lys Asn Gln Gln Glu
        115                 120                 125

cgc ttt gag aac tca gaa ctt cgg aat ctg aac aac cac ctt agg tct      432
Arg Phe Glu Asn Ser Glu Leu Arg Asn Leu Asn Asn His Leu Arg Ser
    130                 135                 140

gaa aat cag cgg tta cga gaa gct att cat caa gcc tta tgc cct aag      480
Glu Asn Gln Arg Leu Arg Glu Ala Ile His Gln Ala Leu Cys Pro Lys
145                 150                 155                 160

tgt gga ggc caa act gca att ggc gaa atg acc ttc gaa gag cac cat      528
Cys Gly Gly Gln Thr Ala Ile Gly Glu Met Thr Phe Glu Glu His His
                165                 170                 175

ctt cgc atc ctc aac gct cgt ttg act gaa gag atc aag caa ctt tcc      576
Leu Arg Ile Leu Asn Ala Arg Leu Thr Glu Glu Ile Lys Gln Leu Ser
            180                 185                 190

gtg aca gcg gaa aag ata tca agg ctt acg ggg ata cca gta agg agc      624
Val Thr Ala Glu Lys Ile Ser Arg Leu Thr Gly Ile Pro Val Arg Ser
        195                 200                 205

cat ccc cgt gtg tct cct cct aat cct cct cca aat ttc gag ttc ggg      672
His Pro Arg Val Ser Pro Pro Asn Pro Pro Pro Asn Phe Glu Phe Gly
    210                 215                 220

atg gga tct aag gga aat gtc gga aac cac tcg agg gaa acc act gga      720
Met Gly Ser Lys Gly Asn Val Gly Asn His Ser Arg Glu Thr Thr Gly
225                 230                 235                 240

cct gca gat gct aat acc aag ccg atc atc atg gag ttg gca ttt gga      768
Pro Ala Asp Ala Asn Thr Lys Pro Ile Ile Met Glu Leu Ala Phe Gly
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PCT/US2005/008917

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                245                 250                 255

gcc atg gag gag ctc ttg gtg atg gct caa gtg gct gaa cca ctg tgg      816
Ala Met Glu Glu Leu Leu Val Met Ala Gln Val Ala Glu Pro Leu Trp
            260                 265                 270

atg gga gga ttt aat ggc act agc tta gct ttg aac ttg gat gaa tac      864
Met Gly Gly Phe Asn Gly Thr Ser Leu Ala Leu Asn Leu Asp Glu Tyr
        275                 280                 285

gaa aag acg ttt cgc acg ggt ctc ggt cct aga ctt ggc ggg ttt cga      912
Glu Lys Thr Phe Arg Thr Gly Leu Gly Pro Arg Leu Gly Gly Phe Arg
    290                 295                 300

acc gag gca tcc agg gaa act gca ctc gtg gca atg tgt cct act ggc      960
Thr Glu Ala Ser Arg Glu Thr Ala Leu Val Ala Met Cys Pro Thr Gly
305                 310                 315                 320

att gtt gaa atg ctc atg caa gag aat ctg tgg tca aca atg ttt gcc     1008
Ile Val Glu Met Leu Met Gln Glu Asn Leu Trp Ser Thr Met Phe Ala
                325                 330                 335

gga att gtt ggt aga gcc agg act cat gaa cag ata atg gct gat gct     1056
Gly Ile Val Gly Arg Ala Arg Thr His Glu Gln Ile Met Ala Asp Ala
            340                 345                 350

gct gga aac ttc aat gga aat ctc caa ata atg agt gct gag tac caa     1104
Ala Gly Asn Phe Asn Gly Asn Leu Gln Ile Met Ser Ala Glu Tyr Gln
        355                 360                 365

gtg ctt tcc ccg cta gtc aca acc cgc gaa agc tac ttc gtc cgc tac     1152
Val Leu Ser Pro Leu Val Thr Thr Arg Glu Ser Tyr Phe Val Arg Tyr
    370                 375                 380

tgt aag caa caa gga gag ggt ttg tgg gcg gtg gtc gat att tcc atc     1200
Cys Lys Gln Gln Gly Glu Gly Leu Trp Ala Val Val Asp Ile Ser Ile
385                 390                 395                 400

gac cat ctc ctc cca aac atc aac cta aaa tgt cgc cgc cga ccc tct     1248
Asp His Leu Leu Pro Asn Ile Asn Leu Lys Cys Arg Arg Arg Pro Ser
                405                 410                 415

gga tgt ctg att caa gaa atg cat agt ggt tac tcc aag gtt aca tgg     1296
Gly Cys Leu Ile Gln Glu Met His Ser Gly Tyr Ser Lys Val Thr Trp
            420                 425                 430

gtg gaa cat gtg gaa gta gat gat gca gga agt tac agc atc ttt gag     1344
Val Glu His Val Glu Val Asp Asp Ala Gly Ser Tyr Ser Ile Phe Glu
        435                 440                 445

aaa tta atc tgt act ggt caa gct ttt gct gct aac cgc tgg gtt ggt     1392
Lys Leu Ile Cys Thr Gly Gln Ala Phe Ala Ala Asn Arg Trp Val Gly
    450                 455                 460

aca ttg gta cgc cag tgt gag cgg ata tct agc atc ttg tcg aca gat     1440
Thr Leu Val Arg Gln Cys Glu Arg Ile Ser Ser Ile Leu Ser Thr Asp
465                 470                 475                 480
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ttt caa tct gtc gat tcc ggt gat cac ata acg cta act aac cat gga      1488
Phe Gln Ser Val Asp Ser Gly Asp His Ile Thr Leu Thr Asn His Gly
                485                 490                 495

aag atg agc atg ctg aag ata gct gag cgg att gcg aga acc ttc ttt      1536
Lys Met Ser Met Leu Lys Ile Ala Glu Arg Ile Ala Arg Thr Phe Phe
            500                 505                 510

gct gga atg acc aat gcg acg ggg tct aca ata ttt tct ggt gtt gaa      1584
Ala Gly Met Thr Asn Ala Thr Gly Ser Thr Ile Phe Ser Gly Val Glu
        515                 520                 525

gga gaa gat atc aga gtg atg aca atg aag agc gtg aat gat cca gga      1632
Gly Glu Asp Ile Arg Val Met Thr Met Lys Ser Val Asn Asp Pro Gly
    530                 535                 540

aag cct ccc ggt gtc att att tgt gca gcc act tcc ttt tgg ctt cct      1680
Lys Pro Pro Gly Val Ile Ile Cys Ala Ala Thr Ser Phe Trp Leu Pro
545                 550                 555                 560

gct cct cct aac act gtc ttt gac ttc ctc aga gag gct act cac cga      1728
Ala Pro Pro Asn Thr Val Phe Asp Phe Leu Arg Glu Ala Thr His Arg
                565                 570                 575

cac aat tgg gat gtt ctc tgc aac gga gag atg atg cac aag ata gca      1776
His Asn Trp Asp Val Leu Cys Asn Gly Glu Met Met His Lys Ile Ala
            580                 585                 590

gag att acg aat ggg ata gac aaa agg aac tgt gca agt tta ctc cgg      1824
Glu Ile Thr Asn Gly Ile Asp Lys Arg Asn Cys Ala Ser Leu Leu Arg
        595                 600                 605

cat gga cac act agc aag agc aag atg atg ata gtt caa gag act tct      1872
His Gly His Thr Ser Lys Ser Lys Met Met Ile Val Gln Glu Thr Ser
    610                 615                 620

act gac cca aca gct tca ttt gtg ctt tat gcg cct gtt gat atg aca      1920
Thr Asp Pro Thr Ala Ser Phe Val Leu Tyr Ala Pro Val Asp Met Thr
625                 630                 635                 640

tca atg gat att act ctc cat gga ggt ggt gat cct gac ttt gtg gtg      1968
Ser Met Asp Ile Thr Leu His Gly Gly Gly Asp Pro Asp Phe Val Val
                645                 650                 655

atc ctg cct tct ggt ttt gct att ttt cca gat ggt acg ggt aag cct      2016
Ile Leu Pro Ser Gly Phe Ala Ile Phe Pro Asp Gly Thr Gly Lys Pro
            660                 665                 670

gga gga aaa gaa gga gga tca ctt ttg acc att tcc ttc caa atg ctg      2064
Gly Gly Lys Glu Gly Gly Ser Leu Leu Thr Ile Ser Phe Gln Met Leu
        675                 680                 685

gtt gag tca ggt cct gag gct agg ctg agt gtt agc tct gtt gca act      2112
Val Glu Ser Gly Pro Glu Ala Arg Leu Ser Val Ser Ser Val Ala Thr
    690                 695                 700
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act gag aat ctg att cgt aca acc gtg cgg agg atc aaa gat ttg ttt 2160
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cct tgt cag act gct tga 2178
Pro Cys Gln Thr Ala
725

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Asn Asp Asn Glu Asn Asn Asn Asn Asn Asn Asn Asn Gly Gly Thr Asp
20 25 30

Asn Thr Asn Ala Gly Asn Asp Ser Gly Asp Gln Asp Phe Asp Ser Gly
35 40 45

Asn Thr Ser Ser Gly Asn His Gly Glu Gly Leu Gly Asn Asn Gln Ala
50 55 60

Pro Arg His Lys Lys Lys Lys Tyr Asn Arg His Thr Gln Leu Gln Ile
65 70 75 80

Ser Glu Met Glu Ala Phe Phe Arg Glu Cys Pro His Pro Asp Asp Lys
85 90 95

Gln Arg Tyr Asp Leu Ser Ala Gln Leu Gly Leu Asp Pro Val Gln Ile
100 105 110

Lys Phe Trp Phe Gln Asn Lys Arg Thr Gln Asn Lys Asn Gln Gln Glu
115 120 125

Arg Phe Glu Asn Ser Glu Leu Arg Asn Leu Asn Asn His Leu Arg Ser
130 135 140

Glu Asn Gln Arg Leu Arg Glu Ala Ile His Gln Ala Leu Cys Pro Lys
145 150 155 160

Cys Gly Gly Gln Thr Ala Ile Gly Glu Met Thr Phe Glu Glu His His
165 170 175

Leu Arg Ile Leu Asn Ala Arg Leu Thr Glu Glu Ile Lys Gln Leu Ser
180 185 190

Val Thr Ala Glu Lys Ile Ser Arg Leu Thr Gly Ile Pro Val Arg Ser
195 200 205

His Pro Arg Val Ser Pro Pro Asn Pro Pro Pro Asn Phe Glu Phe Gly
210 215 220

Met Gly Ser Lys Gly Asn Val Gly Asn His Ser Arg Glu Thr Thr Gly
225 230 235 240

Pro Ala Asp Ala Asn Thr Lys Pro Ile Ile Met Glu Leu Ala Phe Gly
245 250 255

Ala Met Glu Glu Leu Leu Val Met Ala Gln Val Ala Glu Pro Leu Trp
260 265 270

Met Gly Gly Phe Asn Gly Thr Ser Leu Ala Leu Asn Leu Asp Glu Tyr
275 280 285

Glu Lys Thr Phe Arg Thr Gly Leu Gly Pro Arg Leu Gly Gly Phe Arg
290 295 300

Thr Glu Ala Ser Arg Glu Thr Ala Leu Val Ala Met Cys Pro Thr Gly
305 310 315 320

Ile Val Glu Met Leu Met Gln Glu Asn Leu Trp Ser Thr Met Phe Ala
325 330 335

Gly Ile Val Gly Arg Ala Arg Thr His Glu Gln Ile Met Ala Asp Ala
340 345 350

Ala Gly Asn Phe Asn Gly Asn Leu Gln Ile Met Ser Ala Glu Tyr Gln
355 360 365

Val Leu Ser Pro Leu Val Thr Thr Arg Glu Ser Tyr Phe Val Arg Tyr
370 375 380

Cys Lys Gln Gln Gly Glu Gly Leu Trp Ala Val Val Asp Ile Ser Ile
385 390 395 400

Asp His Leu Leu Pro Asn Ile Asn Leu Lys Cys Arg Arg Arg Pro Ser
405 410 415

Gly Cys Leu Ile Gln Glu Met His Ser Gly Tyr Ser Lys Val Thr Trp
420 425 430

Val Glu His Val Glu Val Asp Asp Ala Gly Ser Tyr Ser Ile Phe Glu
435 440 445

Lys Leu Ile Cys Thr Gly Gln Ala Phe Ala Ala Asn Arg Trp Val Gly
450 455 460

Thr Leu Val Arg Gln Cys Glu Arg Ile Ser Ser Ile Leu Ser Thr Asp
465 470 475 480

Phe Gln Ser Val Asp Ser Gly Asp His Ile Thr Leu Thr Asn His Gly
485 490 495

Lys Met Ser Met Leu Lys Ile Ala Glu Arg Ile Ala Arg Thr Phe Phe
500 505 510

Ala Gly Met Thr Asn Ala Thr Gly Ser Thr Ile Phe Ser Gly Val Glu
515 520 525

Gly Glu Asp Ile Arg Val Met Thr Met Lys Ser Val Asn Asp Pro Gly
530 535 540

Lys Pro Pro Gly Val Ile Ile Cys Ala Ala Thr Ser Phe Trp Leu Pro
545 550 555 560

Ala Pro Pro Asn Thr Val Phe Asp Phe Leu Arg Glu Ala Thr His Arg
565 570 575

His Asn Trp Asp Val Leu Cys Asn Gly Glu Met Met His Lys Ile Ala
580 585 590

Glu Ile Thr Asn Gly Ile Asp Lys Arg Asn Cys Ala Ser Leu Leu Arg
595 600 605

His Gly His Thr Ser Lys Ser Lys Met Met Ile Val Gln Glu Thr Ser
610 615 620

Thr Asp Pro Thr Ala Ser Phe Val Leu Tyr Ala Pro Val Asp Met Thr
625 630 635 640

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Ser Met Asp Ile Thr Leu His Gly Gly Gly Asp Pro Asp Phe Val Val
                645                 650                 655

Ile Leu Pro Ser Gly Phe Ala Ile Phe Pro Asp Gly Thr Gly Lys Pro
            660                 665                 670

Gly Gly Lys Glu Gly Gly Ser Leu Leu Thr Ile Ser Phe Gln Met Leu
        675                 680                 685

Val Glu Ser Gly Pro Glu Ala Arg Leu Ser Val Ser Ser Val Ala Thr
    690                 695                 700

Thr Glu Asn Leu Ile Arg Thr Thr Val Arg Arg Ile Lys Asp Leu Phe
705                 710                 715                 720

Pro Cys Gln Thr Ala
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1               5                   10                  15

caa att ttg caa ctt tgg ttg aaa ttg ata gct gtt ggt tgg aat tta       96
Gln Ile Leu Gln Leu Trp Leu Lys Leu Ile Ala Val Gly Trp Asn Leu
            20                  25                  30

ggg tct aat gat gat gaa ttg tac acg gag cta tgg aaa gct tgt gca      144
Gly Ser Asn Asp Asp Glu Leu Tyr Thr Glu Leu Trp Lys Ala Cys Ala
        35                  40                  45

ggg cca ctt gtg gaa gtt cct cgt tat ggt gaa aga gtt ttc tac ttc      192
Gly Pro Leu Val Glu Val Pro Arg Tyr Gly Glu Arg Val Phe Tyr Phe
    50                  55                  60

cct caa ggt cac atg gaa caa ttg gtt gct tcg act aat caa gga gtt      240
Pro Gln Gly His Met Glu Gln Leu Val Ala Ser Thr Asn Gln Gly Val
65                  70                  75                  80

gtt gat caa gag ata cca gtg ttt aat ctt cct cca aag ata ctt tgt      288
Val Asp Gln Glu Ile Pro Val Phe Asn Leu Pro Pro Lys Ile Leu Cys
                85                  90                  95

cgt gtt ctt agt gtt acg tta aaa gca gaa cat gag acc gat gag gtt      336
Arg Val Leu Ser Val Thr Leu Lys Ala Glu His Glu Thr Asp Glu Val
            100                 105                 110

tac gct cag atc aca tta caa cca gaa gaa gat caa agt gaa cca aca      384
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Tyr Ala Gln Ile Thr Leu Gln Pro Glu Glu Asp Gln Ser Glu Pro Thr
        115                 120                 125

agt ctt gac cca cct tta gta gaa cca gct aaa cca acg gtt gat tct      432
Ser Leu Asp Pro Pro Leu Val Glu Pro Ala Lys Pro Thr Val Asp Ser
    130                 135                 140

ttt gtg aag att cta aca gct tca gat aca agc aca cat ggt gga ttc      480
Phe Val Lys Ile Leu Thr Ala Ser Asp Thr Ser Thr His Gly Gly Phe
145                 150                 155                 160

tct gtt ctt cgt aaa cac gcc act gag tgt tta cct tca ctt gat atg      528
Ser Val Leu Arg Lys His Ala Thr Glu Cys Leu Pro Ser Leu Asp Met
                165                 170                 175

aca caa cct aca ccg act caa gaa ctt gta gct aga gat ctt cac ggc      576
Thr Gln Pro Thr Pro Thr Gln Glu Leu Val Ala Arg Asp Leu His Gly
            180                 185                 190

tat gaa tgg agg ttt aag cat ata ttt aga ggg caa ccg agg agg cat      624
Tyr Glu Trp Arg Phe Lys His Ile Phe Arg Gly Gln Pro Arg Arg His
        195                 200                 205

tta ctt aca acc ggt tgg agt aca ttt gta acc tcg aaa aga ctt gta      672
Leu Leu Thr Thr Gly Trp Ser Thr Phe Val Thr Ser Lys Arg Leu Val
    210                 215                 220

gct gga gat gca ttt gtg ttc ttg agg ggt gaa acc ggg gat tta cgg      720
Ala Gly Asp Ala Phe Val Phe Leu Arg Gly Glu Thr Gly Asp Leu Arg
225                 230                 235                 240

gtt ggt gtg agg cgt tta gct aag cag caa agc acg atg ccc gca tcc      768
Val Gly Val Arg Arg Leu Ala Lys Gln Gln Ser Thr Met Pro Ala Ser
                245                 250                 255

gtt att tcg agt cag agt atg cgt ttg gga gtt ctt gct aca gct tct      816
Val Ile Ser Ser Gln Ser Met Arg Leu Gly Val Leu Ala Thr Ala Ser
            260                 265                 270

cat gct gtt acc aca aca act ata ttt gtt gtc ttc tat aaa cca agg      864
His Ala Val Thr Thr Thr Thr Ile Phe Val Val Phe Tyr Lys Pro Arg
        275                 280                 285

ata agc cag ttt ata att agt gtg aac aag tat atg atg gcg atg aag      912
Ile Ser Gln Phe Ile Ile Ser Val Asn Lys Tyr Met Met Ala Met Lys
    290                 295                 300

aac ggg ttt tct ctc ggt atg cgg tat agg atg aga ttc gaa gga gaa      960
Asn Gly Phe Ser Leu Gly Met Arg Tyr Arg Met Arg Phe Glu Gly Glu
305                 310                 315                 320

gag tct cct gag aga ata ttt aca ggt acc att att ggc agt gga gat     1008
Glu Ser Pro Glu Arg Ile Phe Thr Gly Thr Ile Ile Gly Ser Gly Asp
                325                 330                 335

cta tct tct caa tgg cca gct tcc aaa tgg agg tca ttg cag atc caa     1056
Leu Ser Ser Gln Trp Pro Ala Ser Lys Trp Arg Ser Leu Gln Ile Gln
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                340                 345                 350

tgg gac gag cca tct tct ata cag aga cca aac aag gtc tca ccg tgg     1104
Trp Asp Glu Pro Ser Ser Ile Gln Arg Pro Asn Lys Val Ser Pro Trp
        355                 360                 365

gag atc gag cct ttc tca cca tcc gcg ctt aca cca acc cct act caa     1152
Glu Ile Glu Pro Phe Ser Pro Ser Ala Leu Thr Pro Thr Pro Thr Gln
    370                 375                 380

caa caa tca aag tcc aaa cgg tcc aga cca atc tca gaa atc aca ggg     1200
Gln Gln Ser Lys Ser Lys Arg Ser Arg Pro Ile Ser Glu Ile Thr Gly
385                 390                 395                 400

agt cct gta gct tct agt ttc ttg agt agt ttc tcg cag agc cac gag     1248
Ser Pro Val Ala Ser Ser Phe Leu Ser Ser Phe Ser Gln Ser His Glu
                405                 410                 415

tct aat cca tcg gtc aaa ctg ttg ttt caa gat cca gca acc gag aga     1296
Ser Asn Pro Ser Val Lys Leu Leu Phe Gln Asp Pro Ala Thr Glu Arg
            420                 425                 430

aac tca aac aaa tca gtg ttt tca agt gga tta caa tgc aag ata acc     1344
Asn Ser Asn Lys Ser Val Phe Ser Ser Gly Leu Gln Cys Lys Ile Thr
        435                 440                 445

gag gct ccg gtc aca agt agt tgt agg tta ttc gga ttc gat ctc acg     1392
Glu Ala Pro Val Thr Ser Ser Cys Arg Leu Phe Gly Phe Asp Leu Thr
    450                 455                 460

agc aag cct gct tct gct aca att cct cat gac aag cag cta ata agt     1440
Ser Lys Pro Ala Ser Ala Thr Ile Pro His Asp Lys Gln Leu Ile Ser
465                 470                 475                 480

gtg gat tca aat ata tct gat tct acc acc aag tgt caa gat cct aac     1488
Val Asp Ser Asn Ile Ser Asp Ser Thr Thr Lys Cys Gln Asp Pro Asn
                485                 490                 495

tct tca aac tca cca aaa gag cag aaa caa caa aca tcc aca aga agc     1536
Ser Ser Asn Ser Pro Lys Glu Gln Lys Gln Gln Thr Ser Thr Arg Ser
            500                 505                 510

cga atc aag gtg caa atg caa gga aca gcg gtt gga cgc gcg gtt gat     1584
Arg Ile Lys Val Gln Met Gln Gly Thr Ala Val Gly Arg Ala Val Asp
        515                 520                 525

tta aca ttg ttg aga tca tac gat gaa cta ata aaa gag cta gag aaa     1632
Leu Thr Leu Leu Arg Ser Tyr Asp Glu Leu Ile Lys Glu Leu Glu Lys
    530                 535                 540

atg ttt gag att gaa gga gaa ctt agt cct aaa gac aaa tgg gct atc     1680
Met Phe Glu Ile Glu Gly Glu Leu Ser Pro Lys Asp Lys Trp Ala Ile
545                 550                 555                 560

gtg ttt aca gac gat gaa gga gat agg atg ctt gta gga gat gat cca     1728
Val Phe Thr Asp Asp Glu Gly Asp Arg Met Leu Val Gly Asp Asp Pro
                565                 570                 575
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tgg aat gag ttc tgt aaa atg gca aag aag tta ttc ata tat ccg agt     1776
Trp Asn Glu Phe Cys Lys Met Ala Lys Lys Leu Phe Ile Tyr Pro Ser
            580                 585                 590

gat gag gtc aag aaa atg agg tcg aag tcg ttg ttg ggt gat aaa ggt     1824
Asp Glu Val Lys Lys Met Arg Ser Lys Ser Leu Leu Gly Asp Lys Gly
        595                 600                 605

acg atc gta aat ctt gaa tca gat cag agg aca gtt cac gtt taa         1869
Thr Ile Val Asn Leu Glu Ser Asp Gln Arg Thr Val His Val
    610                 615                 620
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            20                  25                  30

Gly Ser Asn Asp Asp Glu Leu Tyr Thr Glu Leu Trp Lys Ala Cys Ala
        35                  40                  45

Gly Pro Leu Val Glu Val Pro Arg Tyr Gly Glu Arg Val Phe Tyr Phe
    50                  55                  60

Pro Gln Gly His Met Glu Gln Leu Val Ala Ser Thr Asn Gln Gly Val
65                  70                  75                  80

Val Asp Gln Glu Ile Pro Val Phe Asn Leu Pro Pro Lys Ile Leu Cys
                85                  90                  95

Arg Val Leu Ser Val Thr Leu Lys Ala Glu His Glu Thr Asp Glu Val
            100                 105                 110

Tyr Ala Gln Ile Thr Leu Gln Pro Glu Glu Asp Gln Ser Glu Pro Thr
        115                 120                 125

Ser Leu Asp Pro Pro Leu Val Glu Pro Ala Lys Pro Thr Val Asp Ser
    130                 135                 140

Phe Val Lys Ile Leu Thr Ala Ser Asp Thr Ser Thr His Gly Gly Phe
145                 150                 155                 160

Ser Val Leu Arg Lys His Ala Thr Glu Cys Leu Pro Ser Leu Asp Met
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165 170 175

Thr Gln Pro Thr Pro Thr Gln Glu Leu Val Ala Arg Asp Leu His Gly
180 185 190

Tyr Glu Trp Arg Phe Lys His Ile Phe Arg Gly Gln Pro Arg Arg His
195 200 205

Leu Leu Thr Thr Gly Trp Ser Thr Phe Val Thr Ser Lys Arg Leu Val
210 215 220

Ala Gly Asp Ala Phe Val Phe Leu Arg Gly Glu Thr Gly Asp Leu Arg
225 230 235 240

Val Gly Val Arg Arg Leu Ala Lys Gln Gln Ser Thr Met Pro Ala Ser
245 250 255

Val Ile Ser Ser Gln Ser Met Arg Leu Gly Val Leu Ala Thr Ala Ser
260 265 270

His Ala Val Thr Thr Thr Thr Ile Phe Val Val Phe Tyr Lys Pro Arg
275 280 285

Ile Ser Gln Phe Ile Ile Ser Val Asn Lys Tyr Met Met Ala Met Lys
290 295 300

Asn Gly Phe Ser Leu Gly Met Arg Tyr Arg Met Arg Phe Glu Gly Glu
305 310 315 320

Glu Ser Pro Glu Arg Ile Phe Thr Gly Thr Ile Ile Gly Ser Gly Asp
325 330 335

Leu Ser Ser Gln Trp Pro Ala Ser Lys Trp Arg Ser Leu Gln Ile Gln
340 345 350

Trp Asp Glu Pro Ser Ser Ile Gln Arg Pro Asn Lys Val Ser Pro Trp
355 360 365

Glu Ile Glu Pro Phe Ser Pro Ser Ala Leu Thr Pro Thr Pro Thr Gln
370 375 380

Gln Gln Ser Lys Ser Lys Arg Ser Arg Pro Ile Ser Glu Ile Thr Gly
385 390 395 400

Ser Pro Val Ala Ser Ser Phe Leu Ser Ser Phe Ser Gln Ser His Glu
405 410 415

Ser Asn Pro Ser Val Lys Leu Leu Phe Gln Asp Pro Ala Thr Glu Arg
420 425 430

Asn Ser Asn Lys Ser Val Phe Ser Ser Gly Leu Gln Cys Lys Ile Thr
435 440 445

Glu Ala Pro Val Thr Ser Ser Cys Arg Leu Phe Gly Phe Asp Leu Thr
450 455 460

Ser Lys Pro Ala Ser Ala Thr Ile Pro His Asp Lys Gln Leu Ile Ser
465 470 475 480

Val Asp Ser Asn Ile Ser Asp Ser Thr Thr Lys Cys Gln Asp Pro Asn
485 490 495

Ser Ser Asn Ser Pro Lys Glu Gln Lys Gln Gln Thr Ser Thr Arg Ser
500 505 510

Arg Ile Lys Val Gln Met Gln Gly Thr Ala Val Gly Arg Ala Val Asp
515 520 525

Leu Thr Leu Leu Arg Ser Tyr Asp Glu Leu Ile Lys Glu Leu Glu Lys
530 535 540

Met Phe Glu Ile Glu Gly Glu Leu Ser Pro Lys Asp Lys Trp Ala Ile
545 550 555 560

Val Phe Thr Asp Asp Glu Gly Asp Arg Met Leu Val Gly Asp Asp Pro
565 570 575

Trp Asn Glu Phe Cys Lys Met Ala Lys Lys Leu Phe Ile Tyr Pro Ser
580 585 590

Asp Glu Val Lys Lys Met Arg Ser Lys Ser Leu Leu Gly Asp Lys Gly
595 600 605

Thr Ile Val Asn Leu Glu Ser Asp Gln Arg Thr Val His Val
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cca aag agt acc tct gat aac gac ttg gga atc acc ggt agc cga gaa       96
Pro Lys Ser Thr Ser Asp Asn Asp Leu Gly Ile Thr Gly Ser Arg Glu
            20                  25                  30

gat gac ttt gag acc aag tca ggt acc gaa gtc act act gag aat cct      144
Asp Asp Phe Glu Thr Lys Ser Gly Thr Glu Val Thr Thr Glu Asn Pro
        35                  40                  45

tct ggt gaa gag ctt caa gat cct agc caa cgt ccc aac aaa aag aag      192
Ser Gly Glu Glu Leu Gln Asp Pro Ser Gln Arg Pro Asn Lys Lys Lys
    50                  55                  60

cgt tac cat cgc cac acg caa cgc caa att caa gag ctc gaa tca ttc      240
Arg Tyr His Arg His Thr Gln Arg Gln Ile Gln Glu Leu Glu Ser Phe
65                  70                  75                  80

ttt aag gaa tgt cct cat cca gat gat aag caa cga aaa gag ttg agc      288
Phe Lys Glu Cys Pro His Pro Asp Asp Lys Gln Arg Lys Glu Leu Ser
                85                  90                  95

cgt gat ctc aat tta gag cct ctt caa gtt aag ttt tgg ttc caa aac      336
Arg Asp Leu Asn Leu Glu Pro Leu Gln Val Lys Phe Trp Phe Gln Asn
            100                 105                 110

aaa cgc aca cag atg aag gca caa agt gag agg cat gag aac cag att      384
Lys Arg Thr Gln Met Lys Ala Gln Ser Glu Arg His Glu Asn Gln Ile
        115                 120                 125

cta aag tca gac aat gac aag ctc aga gca gag aac aat aga tac aaa      432
Leu Lys Ser Asp Asn Asp Lys Leu Arg Ala Glu Asn Asn Arg Tyr Lys
    130                 135                 140

gaa gct cta agc aat gct aca tgc cct aac tgt ggc ggt cca gct gct      480
Glu Ala Leu Ser Asn Ala Thr Cys Pro Asn Cys Gly Gly Pro Ala Ala
145                 150                 155                 160

att gga gaa atg tct ttt gac gaa caa cat ctc agg atc gaa aat gct      528
Ile Gly Glu Met Ser Phe Asp Glu Gln His Leu Arg Ile Glu Asn Ala
                165                 170                 175

cgg ctc cgc gaa gag att gat agg atc tct gct att gct gcg aaa tac      576
Arg Leu Arg Glu Glu Ile Asp Arg Ile Ser Ala Ile Ala Ala Lys Tyr
            180                 185                 190

gtt ggg aag ccg tta gga tcg tct ttc gct cca cta gcg atc cac gcg      624
Val Gly Lys Pro Leu Gly Ser Ser Phe Ala Pro Leu Ala Ile His Ala
        195                 200                 205
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cct tct cgt tcg ctt gat ctt gaa gtt gga aac ttt ggg aac cag aca      672
Pro Ser Arg Ser Leu Asp Leu Glu Val Gly Asn Phe Gly Asn Gln Thr
    210                 215                 220

ggc ttt gta gga gaa atg tat gga aca ggg gac att ttg agg tca gtt      720
Gly Phe Val Gly Glu Met Tyr Gly Thr Gly Asp Ile Leu Arg Ser Val
225                 230                 235                 240

tcg att cct tct gag act gat aag cct ata atc gtg gag cta gcg gtt      768
Ser Ile Pro Ser Glu Thr Asp Lys Pro Ile Ile Val Glu Leu Ala Val
                245                 250                 255

gca gct atg gag gaa ctc gtg aga atg gct caa act gga gat cct tta      816
Ala Ala Met Glu Glu Leu Val Arg Met Ala Gln Thr Gly Asp Pro Leu
            260                 265                 270

tgg ctt tca acc gat aat tca gtc gag att ctc aac gaa gaa gag tat      864
Trp Leu Ser Thr Asp Asn Ser Val Glu Ile Leu Asn Glu Glu Glu Tyr
        275                 280                 285

ttc aga acg ttt ccg aga gga att gga cca aag cca tta gga tta aga      912
Phe Arg Thr Phe Pro Arg Gly Ile Gly Pro Lys Pro Leu Gly Leu Arg
    290                 295                 300

tca gag gcg tca aga caa tct gca gtt gtt ata atg aat cac atc aat      960
Ser Glu Ala Ser Arg Gln Ser Ala Val Val Ile Met Asn His Ile Asn
305                 310                 315                 320

ctc gtt gag att ctc atg gat gtg aat caa tgg tct tgt gtt ttc tct     1008
Leu Val Glu Ile Leu Met Asp Val Asn Gln Trp Ser Cys Val Phe Ser
                325                 330                 335

ggg att gtg tca aga gcc ttg aca ctt gaa gtt ctt tca act gga gtt     1056
Gly Ile Val Ser Arg Ala Leu Thr Leu Glu Val Leu Ser Thr Gly Val
            340                 345                 350

gct ggg aac tac aac ggt gct tta caa gtg atg aca gct gag ttt caa     1104
Ala Gly Asn Tyr Asn Gly Ala Leu Gln Val Met Thr Ala Glu Phe Gln
        355                 360                 365

gtt cca tca ccc cta gtc cca acg cgt gag aac tac ttt gtg aga tac     1152
Val Pro Ser Pro Leu Val Pro Thr Arg Glu Asn Tyr Phe Val Arg Tyr
    370                 375                 380

tgc aaa caa cac agt gac ggc tct tgg gct gtg gtt gat gtc tct ttg     1200
Cys Lys Gln His Ser Asp Gly Ser Trp Ala Val Val Asp Val Ser Leu
385                 390                 395                 400

gac agc ctt aga cca agt act cca atc tta aga act aga aga agg cct     1248
Asp Ser Leu Arg Pro Ser Thr Pro Ile Leu Arg Thr Arg Arg Arg Pro
                405                 410                 415

tca ggt tgt ctg att caa gaa ttg cct aat ggt tat tct aag gtt aca     1296
Ser Gly Cys Leu Ile Gln Glu Leu Pro Asn Gly Tyr Ser Lys Val Thr
            420                 425                 430

tgg ata gag cat atg gag gta gat gat aga tca gtt cac aac atg tat     1344
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Trp Ile Glu His Met Glu Val Asp Asp Arg Ser Val His Asn Met Tyr
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aaa ccg ttg gtt cag tcc ggt tta gct ttc ggt gcg aaa cgt tgg gtg     1392
Lys Pro Leu Val Gln Ser Gly Leu Ala Phe Gly Ala Lys Arg Trp Val
    450                 455                 460

gct aca ctc gaa cga caa tgc gag cgg ctt gct agc tcc atg gcc agc     1440
Ala Thr Leu Glu Arg Gln Cys Glu Arg Leu Ala Ser Ser Met Ala Ser
465                 470                 475                 480

aac att cct ggt gat ctt tcc gtg ata acg agt cct gaa gga agg aag     1488
Asn Ile Pro Gly Asp Leu Ser Val Ile Thr Ser Pro Glu Gly Arg Lys
                485                 490                 495

agt atg ttg aag cta gct gag aga atg gtt atg agt ttc tgc agt ggt     1536
Ser Met Leu Lys Leu Ala Glu Arg Met Val Met Ser Phe Cys Ser Gly
            500                 505                 510

gtt ggc gcg tcg act gca cac gct tgg aca aca atg tcg aca aca gga     1584
Val Gly Ala Ser Thr Ala His Ala Trp Thr Thr Met Ser Thr Thr Gly
        515                 520                 525

tcc gat gat gtt cgg gtc atg acc cgc aag agt atg gat gat cca gga     1632
Ser Asp Asp Val Arg Val Met Thr Arg Lys Ser Met Asp Asp Pro Gly
    530                 535                 540

aga cct ccg ggt att gtt ctt agt gca gct act tca ttc tgg atc cca     1680
Arg Pro Pro Gly Ile Val Leu Ser Ala Ala Thr Ser Phe Trp Ile Pro
545                 550                 555                 560

gtt gct ccc aaa cgt gtt ttt gat ttc ctc cgt gac gaa aat tca aga     1728
Val Ala Pro Lys Arg Val Phe Asp Phe Leu Arg Asp Glu Asn Ser Arg
                565                 570                 575

aaa gag tgg gat att ctg tca aat gga ggt atg gtt cag gaa atg gct     1776
Lys Glu Trp Asp Ile Leu Ser Asn Gly Gly Met Val Gln Glu Met Ala
            580                 585                 590

cat ata gcc aat ggt cat gaa cct gga aac tgt gtc tcc ttg ctc cga     1824
His Ile Ala Asn Gly His Glu Pro Gly Asn Cys Val Ser Leu Leu Arg
        595                 600                 605

gtc aat agt gga aac tcg agc cag agc aac atg ttg att cta caa gag     1872
Val Asn Ser Gly Asn Ser Ser Gln Ser Asn Met Leu Ile Leu Gln Glu
    610                 615                 620

agc tgt aca gat gca tca gga tcg tat gtg att tac gcg cca gtg gat     1920
Ser Cys Thr Asp Ala Ser Gly Ser Tyr Val Ile Tyr Ala Pro Val Asp
625                 630                 635                 640

ata gtg gcg atg aat gtg gtt cta agc ggt gga gat cct gat tac gtg     1968
Ile Val Ala Met Asn Val Val Leu Ser Gly Gly Asp Pro Asp Tyr Val
                645                 650                 655

gcg ttg ttg ccg tct ggt ttt gct att tta ccg gat ggt tcg gtt gga     2016
Ala Leu Leu Pro Ser Gly Phe Ala Ile Leu Pro Asp Gly Ser Val Gly
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            660                 665                 670

gga gga gat ggg aat cag cat cag gaa atg gtt tct act act tct tct     2064
Gly Gly Asp Gly Asn Gln His Gln Glu Met Val Ser Thr Thr Ser Ser
        675                 680                 685

ggg agt tgt ggt ggt tcg ctt tta acc gtt gcg ttt cag att ctt gtt     2112
Gly Ser Cys Gly Gly Ser Leu Leu Thr Val Ala Phe Gln Ile Leu Val
    690                 695                 700

gac tct gtt cct aca gct aaa ctc tca ctt ggc tcg gtg gct acg gtt     2160
Asp Ser Val Pro Thr Ala Lys Leu Ser Leu Gly Ser Val Ala Thr Val
705                 710                 715                 720

aat agt ctg atc aaa tgt acg gtg gag agg att aaa gct gct gtt tct     2208
Asn Ser Leu Ile Lys Cys Thr Val Glu Arg Ile Lys Ala Ala Val Ser
                725                 730                 735

tgt gat gtt gga gga gga gcg tag                                    2232
Cys Asp Val Gly Gly Gly Ala
            740
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            20                  25                  30

Asp Asp Phe Glu Thr Lys Ser Gly Thr Glu Val Thr Thr Glu Asn Pro
        35                  40                  45

Ser Gly Glu Glu Leu Gln Asp Pro Ser Gln Arg Pro Asn Lys Lys Lys
    50                  55                  60

Arg Tyr His Arg His Thr Gln Arg Gln Ile Gln Glu Leu Glu Ser Phe
65                  70                  75                  80

Phe Lys Glu Cys Pro His Pro Asp Asp Lys Gln Arg Lys Glu Leu Ser
                85                  90                  95

Arg Asp Leu Asn Leu Glu Pro Leu Gln Val Lys Phe Trp Phe Gln Asn
            100                 105                 110

Lys Arg Thr Gln Met Lys Ala Gln Ser Glu Arg His Glu Asn Gln Ile
        115                 120                 125
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Leu Lys Ser Asp Asn Asp Lys Leu Arg Ala Glu Asn Asn Arg Tyr Lys
130 135 140

Glu Ala Leu Ser Asn Ala Thr Cys Pro Asn Cys Gly Gly Pro Ala Ala
145 150 155 160

Ile Gly Glu Met Ser Phe Asp Glu Gln His Leu Arg Ile Glu Asn Ala
165 170 175

Arg Leu Arg Glu Glu Ile Asp Arg Ile Ser Ala Ile Ala Ala Lys Tyr
180 185 190

Val Gly Lys Pro Leu Gly Ser Ser Phe Ala Pro Leu Ala Ile His Ala
195 200 205

Pro Ser Arg Ser Leu Asp Leu Glu Val Gly Asn Phe Gly Asn Gln Thr
210 215 220

Gly Phe Val Gly Glu Met Tyr Gly Thr Gly Asp Ile Leu Arg Ser Val
225 230 235 240

Ser Ile Pro Ser Glu Thr Asp Lys Pro Ile Ile Val Glu Leu Ala Val
245 250 255

Ala Ala Met Glu Glu Leu Val Arg Met Ala Gln Thr Gly Asp Pro Leu
260 265 270

Trp Leu Ser Thr Asp Asn Ser Val Glu Ile Leu Asn Glu Glu Glu Tyr
275 280 285

Phe Arg Thr Phe Pro Arg Gly Ile Gly Pro Lys Pro Leu Gly Leu Arg
290 295 300

Ser Glu Ala Ser Arg Gln Ser Ala Val Val Ile Met Asn His Ile Asn
305 310 315 320

Leu Val Glu Ile Leu Met Asp Val Asn Gln Trp Ser Cys Val Phe Ser
325 330 335

Gly Ile Val Ser Arg Ala Leu Thr Leu Glu Val Leu Ser Thr Gly Val
340 345 350

Ala Gly Asn Tyr Asn Gly Ala Leu Gln Val Met Thr Ala Glu Phe Gln

355 360 365

Val Pro Ser Pro Leu Val Pro Thr Arg Glu Asn Tyr Phe Val Arg Tyr
370 375 380

Cys Lys Gln His Ser Asp Gly Ser Trp Ala Val Val Asp Val Ser Leu
385 390 395 400

Asp Ser Leu Arg Pro Ser Thr Pro Ile Leu Arg Thr Arg Arg Arg Pro
405 410 415

Ser Gly Cys Leu Ile Gln Glu Leu Pro Asn Gly Tyr Ser Lys Val Thr
420 425 430

Trp Ile Glu His Met Glu Val Asp Asp Arg Ser Val His Asn Met Tyr
435 440 445

Lys Pro Leu Val Gln Ser Gly Leu Ala Phe Gly Ala Lys Arg Trp Val
450 455 460

Ala Thr Leu Glu Arg Gln Cys Glu Arg Leu Ala Ser Ser Met Ala Ser
465 470 475 480

Asn Ile Pro Gly Asp Leu Ser Val Ile Thr Ser Pro Glu Gly Arg Lys
485 490 495

Ser Met Leu Lys Leu Ala Glu Arg Met Val Met Ser Phe Cys Ser Gly
500 505 510

Val Gly Ala Ser Thr Ala His Ala Trp Thr Thr Met Ser Thr Thr Gly
515 520 525

Ser Asp Asp Val Arg Val Met Thr Arg Lys Ser Met Asp Asp Pro Gly
530 535 540

Arg Pro Pro Gly Ile Val Leu Ser Ala Ala Thr Ser Phe Trp Ile Pro
545 550 555 560

Val Ala Pro Lys Arg Val Phe Asp Phe Leu Arg Asp Glu Asn Ser Arg
565 570 575

Lys Glu Trp Asp Ile Leu Ser Asn Gly Gly Met Val Gln Glu Met Ala
580 585 590

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His Ile Ala Asn Gly His Glu Pro Gly Asn Cys Val Ser Leu Leu Arg
        595                 600                 605

Val Asn Ser Gly Asn Ser Ser Gln Ser Asn Met Leu Ile Leu Gln Glu
    610                 615                 620

Ser Cys Thr Asp Ala Ser Gly Ser Tyr Val Ile Tyr Ala Pro Val Asp
625                 630                 635                 640

Ile Val Ala Met Asn Val Val Leu Ser Gly Gly Asp Pro Asp Tyr Val
                645                 650                 655

Ala Leu Leu Pro Ser Gly Phe Ala Ile Leu Pro Asp Gly Ser Val Gly
            660                 665                 670

Gly Gly Asp Gly Asn Gln His Gln Glu Met Val Ser Thr Thr Ser Ser
        675                 680                 685

Gly Ser Cys Gly Gly Ser Leu Leu Thr Val Ala Phe Gln Ile Leu Val
    690                 695                 700

Asp Ser Val Pro Thr Ala Lys Leu Ser Leu Gly Ser Val Ala Thr Val
705                 710                 715                 720

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                                    Met Met Met Asp Glu Phe Met
                                    1               5

gat ctt aga cca gtg aag tac aca gag cac aag act gtt atc aga aag      162
Asp Leu Arg Pro Val Lys Tyr Thr Glu His Lys Thr Val Ile Arg Lys
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tac act aaa aag tcg tct atg gag agg aag acc agt gtt cgt gac tcg      210
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Tyr Thr Lys Lys Ser Ser Met Glu Arg Lys Thr Ser Val Arg Asp Ser
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gcc agg ttg gtt cgg gtc tca atg acg gat cgt gac gcc act gat tca      258
Ala Arg Leu Val Arg Val Ser Met Thr Asp Arg Asp Ala Thr Asp Ser
40                  45                  50                  55

tca agc gac gag gaa gag ttt ctg ttc cct cga aga cgt gtc aag aga      306
Ser Ser Asp Glu Glu Glu Phe Leu Phe Pro Arg Arg Arg Val Lys Arg
                60                  65                  70

ttg att aac gag atc aga gtc gag cct agc agc tct tcc acc ggc gac      354
Leu Ile Asn Glu Ile Arg Val Glu Pro Ser Ser Ser Ser Thr Gly Asp
            75                  80                  85

gtc tct gct tct ccg acg aag gac cgg aaa aga atc aac gtt gat tct      402
Val Ser Ala Ser Pro Thr Lys Asp Arg Lys Arg Ile Asn Val Asp Ser
        90                  95                  100

acg gtt caa aag ccc tct gtt tcc ggc caa aac cag aag aag tac cgc      450
Thr Val Gln Lys Pro Ser Val Ser Gly Gln Asn Gln Lys Lys Tyr Arg
    105                 110                 115

ggc gtg aga cag cga cca tgg gga aaa tgg gcg gcg gag att cgt gat      498
Gly Val Arg Gln Arg Pro Trp Gly Lys Trp Ala Ala Glu Ile Arg Asp
120                 125                 130                 135

cct gag caa cgc cgg aga atc tgg ctc ggt act ttt gca acg gcg gag      546
Pro Glu Gln Arg Arg Arg Ile Trp Leu Gly Thr Phe Ala Thr Ala Glu
                140                 145                 150

gaa gct gcc atc gtc tac gac aac gca gca atc aaa ctt cgt ggc cct      594
Glu Ala Ala Ile Val Tyr Asp Asn Ala Ala Ile Lys Leu Arg Gly Pro
            155                 160                 165

gat gct ctt acc aac ttc acc gta caa cca gaa cca gaa ccg gta caa      642
Asp Ala Leu Thr Asn Phe Thr Val Gln Pro Glu Pro Glu Pro Val Gln
        170                 175                 180

gaa caa gaa caa gaa ccg gag agc aac atg tcg gtt tcg ata tca gaa      690
Glu Gln Glu Gln Glu Pro Glu Ser Asn Met Ser Val Ser Ile Ser Glu
    185                 190                 195

tca atg gac gat tct caa cat cta tca tct ccg aca tcg gtt ctc aac      738
Ser Met Asp Asp Ser Gln His Leu Ser Ser Pro Thr Ser Val Leu Asn
200                 205                 210                 215

tac caa aca tat gtc tcg gag gaa cca atc gat agt ctt atc aaa ccg      786
Tyr Gln Thr Tyr Val Ser Glu Glu Pro Ile Asp Ser Leu Ile Lys Pro
                220                 225                 230

gtt aaa caa gag ttt ctt gaa cca gaa caa gag cca ata agc tgg cat      834
Val Lys Gln Glu Phe Leu Glu Pro Glu Gln Glu Pro Ile Ser Trp His
            235                 240                 245

ctt gga gaa ggt aat act aat act aat gat gat tca ttt cca ttg gac      882
Leu Gly Glu Gly Asn Thr Asn Thr Asn Asp Asp Ser Phe Pro Leu Asp
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        250                 255                 260

att aca ttt ctc gac aac tat ttc aat gaa tca tta cca gac atc tcc      930
Ile Thr Phe Leu Asp Asn Tyr Phe Asn Glu Ser Leu Pro Asp Ile Ser
    265                 270                 275

atc ttc gat caa cct atg tct cct att caa cca aca gag aat gat ttc      978
Ile Phe Asp Gln Pro Met Ser Pro Ile Gln Pro Thr Glu Asn Asp Phe
280                 285                 290                 295

ttc aac gac ctt atg tta ttc gat agc aac gca gaa gaa tac tac tcc     1026
Phe Asn Asp Leu Met Leu Phe Asp Ser Asn Ala Glu Glu Tyr Tyr Ser
                300                 305                 310

tcc gag atc aaa gag att ggt tca tcg ttc aac gat ctt gat gat tct     1074
Ser Glu Ile Lys Glu Ile Gly Ser Ser Phe Asn Asp Leu Asp Asp Ser
            315                 320                 325

ttg ata tcc gat ctc tta ctt gtg tga tatttttgcc attaaccaaa           1121
Leu Ile Ser Asp Leu Leu Leu Val
        330                 335

caccggtttg gttgc                                                   1136


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His Lys Thr Val Ile Arg Lys Tyr Thr Lys Lys Ser Ser Met Glu Arg
            20                  25                  30

Lys Thr Ser Val Arg Asp Ser Ala Arg Leu Val Arg Val Ser Met Thr
        35                  40                  45

Asp Arg Asp Ala Thr Asp Ser Ser Ser Asp Glu Glu Glu Phe Leu Phe
    50                  55                  60

Pro Arg Arg Arg Val Lys Arg Leu Ile Asn Glu Ile Arg Val Glu Pro
65                  70                  75                  80

Ser Ser Ser Ser Thr Gly Asp Val Ser Ala Ser Pro Thr Lys Asp Arg
                85                  90                  95

Lys Arg Ile Asn Val Asp Ser Thr Val Gln Lys Pro Ser Val Ser Gly
            100                 105                 110

Gln Asn Gln Lys Lys Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys
        115                 120                 125
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Replacement Sheet

Trp Ala Ala Glu Ile Arg Asp Pro Glu Gln Arg Arg Arg Ile Trp Leu
130 135 140

Gly Thr Phe Ala Thr Ala Glu Glu Ala Ala Ile Val Tyr Asp Asn Ala
145 150 155 160

Ala Ile Lys Leu Arg Gly Pro Asp Ala Leu Thr Asn Phe Thr Val Gln
165 170 175

Pro Glu Pro Glu Pro Val Gln Glu Gln Glu Gln Glu Pro Glu Ser Asn
180 185 190

Met Ser Val Ser Ile Ser Glu Ser Met Asp Asp Ser Gln His Leu Ser
195 200 205

Ser Pro Thr Ser Val Leu Asn Tyr Gln Thr Tyr Val Ser Glu Glu Pro
210 215 220

Ile Asp Ser Leu Ile Lys Pro Val Lys Gln Glu Phe Leu Glu Pro Glu
225 230 235 240

Gln Glu Pro Ile Ser Trp His Leu Gly Glu Gly Asn Thr Asn Thr Asn
245 250 255

Asp Asp Ser Phe Pro Leu Asp Ile Thr Phe Leu Asp Asn Tyr Phe Asn
260 265 270

Glu Ser Leu Pro Asp Ile Ser Ile Phe Asp Gln Pro Met Ser Pro Ile
275 280 285

Gln Pro Thr Glu Asn Asp Phe Phe Asn Asp Leu Met Leu Phe Asp Ser
290 295 300

Asn Ala Glu Glu Tyr Tyr Ser Ser Glu Ile Lys Glu Ile Gly Ser Ser
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Phe Asn Asp Leu Asp Asp Ser Leu Ile Ser Asp Leu Leu Leu Val
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Met Gly Cys Ala Gln Ser Arg Val Asp Asn Glu Glu Ala Val Ala
1 5 10 15

aga tgc aaa gaa cga cga aac gta atc aaa gaa gca gtt tcc gca agc 158
Arg Cys Lys Glu Arg Arg Asn Val Ile Lys Glu Ala Val Ser Ala Ser
20 25 30

aaa gca ttc gcc gcc ggt cat ttc gct tac gct att gct ttg aaa aac 206
Lys Ala Phe Ala Ala Gly His Phe Ala Tyr Ala Ile Ala Leu Lys Asn
35 40 45

act ggt gct gct tta agt gac tat ggc cat ggc gaa tct gat caa aaa 254
Thr Gly Ala Ala Leu Ser Asp Tyr Gly His Gly Glu Ser Asp Gln Lys
50 55 60

gct tta gac gat gtg ttg tta gat caa caa cat tac gag aaa cag agt 302
Ala Leu Asp Asp Val Leu Leu Asp Gln Gln His Tyr Glu Lys Gln Ser
65 70 75

cgt aac aat gta gat ccg gct tct cct cag cca cct cct cca ccg cct 350
Arg Asn Asn Val Asp Pro Ala Ser Pro Gln Pro Pro Pro Pro Pro Pro
80 85 90 95

att gag aat ctt cct cct ccg cct cct cct ttg cct aaa ttc tct cct 398
Ile Glu Asn Leu Pro Pro Pro Pro Pro Pro Leu Pro Lys Phe Ser Pro
100 105 110

tct ccg att aaa cgt gcg att agt ttg cct tct atg gcg gtt aga ggt 446
Ser Pro Ile Lys Arg Ala Ile Ser Leu Pro Ser Met Ala Val Arg Gly
115 120 125

cga aag gtt cag act tta gat ggt atg gcg att gag gaa gag gaa gaa 494
Arg Lys Val Gln Thr Leu Asp Gly Met Ala Ile Glu Glu Glu Glu Glu
130 135 140

gat gaa gag gag gaa gag gaa gtt aag ggt agt ggt aga gac act gct 542
Asp Glu Glu Glu Glu Glu Glu Val Lys Gly Ser Gly Arg Asp Thr Ala
145 150 155

cag gag gag gag gaa ccg aga acg ccg gag aat gtt ggg aag agt aat 590
Gln Glu Glu Glu Glu Pro Arg Thr Pro Glu Asn Val Gly Lys Ser Asn
160 165 170 175

ggg agg aag aga ttg gag aaa aca acg ccg gag att gtg agt gct tct 638
Gly Arg Lys Arg Leu Glu Lys Thr Thr Pro Glu Ile Val Ser Ala Ser
180 185 190

ccg gca aat agt atg gct tgg gat tat ttt ttc atg gtg gag aat atg 686
Pro Ala Asn Ser Met Ala Trp Asp Tyr Phe Phe Met Val Glu Asn Met
195 200 205

cct gga cct aat tta gat gat aga gag gtt agg aat ggt tat gag aat 734
Pro Gly Pro Asn Leu Asp Asp Arg Glu Val Arg Asn Gly Tyr Glu Asn

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        210                 215                 220

cag agt agt cat ttt cag ttt aat gaa gag gat gat gaa gaa gaa gag      782
Gln Ser Ser His Phe Gln Phe Asn Glu Glu Asp Asp Glu Glu Glu Glu
    225                 230                 235

gaa gag gaa aga tct ggg ata tat cgg aag aag tct ggt tct ggt aaa      830
Glu Glu Glu Arg Ser Gly Ile Tyr Arg Lys Lys Ser Gly Ser Gly Lys
240                 245                 250                 255

gta gtt gag gag atg gag cct aag acg ccg gag aaa gtt gaa gaa gaa      878
Val Val Glu Glu Met Glu Pro Lys Thr Pro Glu Lys Val Glu Glu Glu
                260                 265                 270

gag gag gaa gat gag gaa gag gat gag gaa gag gaa gag gag gag gaa      926
Glu Glu Glu Asp Glu Glu Glu Asp Glu Glu Glu Glu Glu Glu Glu Glu
            275                 280                 285

gaa gaa gtg gtg gtg gag gta aag aag aag aag aaa ggg aaa gct aag      974
Glu Glu Val Val Val Glu Val Lys Lys Lys Lys Lys Gly Lys Ala Lys
        290                 295                 300

att gag cat tcg agt act gct cca ccg gag ttt cgg cgt gcg gtt gct     1022
Ile Glu His Ser Ser Thr Ala Pro Pro Glu Phe Arg Arg Ala Val Ala
    305                 310                 315

aag act agt gct gct gca tca tca agt gtg aat ttg atg aag att ctt     1070
Lys Thr Ser Ala Ala Ala Ser Ser Ser Val Asn Leu Met Lys Ile Leu
320                 325                 330                 335

gat gag att gat gat aga ttc ctt aag gct tca gaa tgt gct caa gag     1118
Asp Glu Ile Asp Asp Arg Phe Leu Lys Ala Ser Glu Cys Ala Gln Glu
                340                 345                 350

gtt tct aag atg ctt gaa gct aca agg tta cat tac cac tcg aat ttt     1166
Val Ser Lys Met Leu Glu Ala Thr Arg Leu His Tyr His Ser Asn Phe
            355                 360                 365

gca gat aac cga gga tat gtt gat cat tca gct aga gta atg cgg gtt     1214
Ala Asp Asn Arg Gly Tyr Val Asp His Ser Ala Arg Val Met Arg Val
        370                 375                 380

ata act tgg aat aaa tcg tta aga ggc att tcg aat gga gaa ggt gga     1262
Ile Thr Trp Asn Lys Ser Leu Arg Gly Ile Ser Asn Gly Glu Gly Gly
    385                 390                 395

aaa gat gat caa gaa tca gat gag cat gaa act cat gct acg gtg ttg     1310
Lys Asp Asp Gln Glu Ser Asp Glu His Glu Thr His Ala Thr Val Leu
400                 405                 410                 415

gat aaa ttg tta gca tgg gag aag aaa ctc tat gat gaa gtg aag caa     1358
Asp Lys Leu Leu Ala Trp Glu Lys Lys Leu Tyr Asp Glu Val Lys Gln
                420                 425                 430

ggt gag ctt atg aag ata gag tat cag aag aag gta tct tta ctc aac     1406
Gly Glu Leu Met Lys Ile Glu Tyr Gln Lys Lys Val Ser Leu Leu Asn
            435                 440                 445
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agg cat aag aaa cga ggt gcg agt gca gag acc gtg gag aaa aca aag     1454
Arg His Lys Lys Arg Gly Ala Ser Ala Glu Thr Val Glu Lys Thr Lys
        450                 455                 460

gcg gct gta agt cat cta cac aca aga tat att gtt gac atg caa tcc     1502
Ala Ala Val Ser His Leu His Thr Arg Tyr Ile Val Asp Met Gln Ser
    465                 470                 475

atg gat tca acg gtt tct gaa gta aac cgt tta agg gat gat caa ttg     1550
Met Asp Ser Thr Val Ser Glu Val Asn Arg Leu Arg Asp Asp Gln Leu
480                 485                 490                 495

tat cca aga ctt gtt gcc tta gtt gaa ggg atg gcg aag atg tgg aca     1598
Tyr Pro Arg Leu Val Ala Leu Val Glu Gly Met Ala Lys Met Trp Thr
                500                 505                 510

aac atg tgt ata cac cac gac acc caa cta ggt att gtt gga gag cta     1646
Asn Met Cys Ile His His Asp Thr Gln Leu Gly Ile Val Gly Glu Leu
            515                 520                 525

aag gcc ctt gaa atc tca act tct ctc aaa gaa acc aca aaa cag cat     1694
Lys Ala Leu Glu Ile Ser Thr Ser Leu Lys Glu Thr Thr Lys Gln His
        530                 535                 540

cac cat cag act cgc cag ttc tgc acc gtc ttg gaa gaa tgg cat gtt     1742
His His Gln Thr Arg Gln Phe Cys Thr Val Leu Glu Glu Trp His Val
    545                 550                 555

cag ttc gat aca ctt gtc acc cat cag aag cag tac att aac tct ctc     1790
Gln Phe Asp Thr Leu Val Thr His Gln Lys Gln Tyr Ile Asn Ser Leu
560                 565                 570                 575

aac aac tgg ctg aag cta aat cta atc ccc atc gag agt agt ctt aaa     1838
Asn Asn Trp Leu Lys Leu Asn Leu Ile Pro Ile Glu Ser Ser Leu Lys
                580                 585                 590

gag aaa gtt tca tca cct cca agg cct cag cgc ccg cca atc caa gct     1886
Glu Lys Val Ser Ser Pro Pro Arg Pro Gln Arg Pro Pro Ile Gln Ala
            595                 600                 605

ctt ctc cac tca tgg cat gac cgt ctt gag aaa ctt ccc gat gaa gtc     1934
Leu Leu His Ser Trp His Asp Arg Leu Glu Lys Leu Pro Asp Glu Val
        610                 615                 620

gcc aaa tca gct atc tcc tct ttc gcg gca gtc atc aaa acc atc ttg     1982
Ala Lys Ser Ala Ile Ser Ser Phe Ala Ala Val Ile Lys Thr Ile Leu
    625                 630                 635

ctg cac cag gaa gag gag atg aaa ctg aaa gag aaa tgc gaa gaa aca     2030
Leu His Gln Glu Glu Glu Met Lys Leu Lys Glu Lys Cys Glu Glu Thr
640                 645                 650                 655

cga aga gag ttt ata cgg aag aag caa ggt ttt gag gat tgg tat caa     2078
Arg Arg Glu Phe Ile Arg Lys Lys Gln Gly Phe Glu Asp Trp Tyr Gln
                660                 665                 670
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aaa cat ttg caa aag aga ggg cca aca gag gaa gct gaa ggc ggg gac     2126
Lys His Leu Gln Lys Arg Gly Pro Thr Glu Glu Ala Glu Gly Gly Asp
            675                 680                 685

gac gca aca aca agc tcc aga gat cat gtc aca gag agg aga att gct     2174
Asp Ala Thr Thr Ser Ser Arg Asp His Val Thr Glu Arg Arg Ile Ala
        690                 695                 700

gtg gag aca ctg aag aaa agg ctt gaa gaa gaa gaa gaa gct cac cag     2222
Val Glu Thr Leu Lys Lys Arg Leu Glu Glu Glu Glu Glu Ala His Gln
    705                 710                 715

aga cat tgt gtt cag gtg agg gag aaa tct cta aac agt ttg aag atc     2270
Arg His Cys Val Gln Val Arg Glu Lys Ser Leu Asn Ser Leu Lys Ile
720                 725                 730                 735

aga ttg cct gag atc ttc agg gca ctg tct gat tat gct cac gct tgt     2318
Arg Leu Pro Glu Ile Phe Arg Ala Leu Ser Asp Tyr Ala His Ala Cys
                740                 745                 750

gct gac tca tat gag aag ctc aga atc ata tcg cag agt cag aaa tca     2366
Ala Asp Ser Tyr Glu Lys Leu Arg Ile Ile Ser Gln Ser Gln Lys Ser
            755                 760                 765

aac ggt gga gcc act gaa tct tct tga accagtttta gttctattta           2413
Asn Gly Gly Ala Thr Glu Ser Ser
        770                 775

acctatgtaa tatgttgtat tatgatggga acattaagca tagttttgtg accagattct   2473

gta                                                                 2476


<210>  450 <211>  775 <212>  PRT <213>  Arabidopsis thaliana  <400>  450

Met Gly Cys Ala Gln Ser Arg Val Asp Asn Glu Glu Ala Val Ala Arg
1               5                   10                  15

Cys Lys Glu Arg Arg Asn Val Ile Lys Glu Ala Val Ser Ala Ser Lys
            20                  25                  30

Ala Phe Ala Ala Gly His Phe Ala Tyr Ala Ile Ala Leu Lys Asn Thr
        35                  40                  45

Gly Ala Ala Leu Ser Asp Tyr Gly His Gly Glu Ser Asp Gln Lys Ala
    50                  55                  60

Leu Asp Asp Val Leu Leu Asp Gln Gln His Tyr Glu Lys Gln Ser Arg
65                  70                  75                  80

Asn Asn Val Asp Pro Ala Ser Pro Gln Pro Pro Pro Pro Pro Pro Ile
                85                  90                  95
```

Glu Asn Leu Pro Pro Pro Pro Pro Pro Leu Pro Lys Phe Ser Pro Ser
100 105 110

Pro Ile Lys Arg Ala Ile Ser Leu Pro Ser Met Ala Val Arg Gly Arg
115 120 125

Lys Val Gln Thr Leu Asp Gly Met Ala Ile Glu Glu Glu Glu Glu Asp
130 135 140

Glu Glu Glu Glu Glu Glu Val Lys Gly Ser Gly Arg Asp Thr Ala Gln
145 150 155 160

Glu Glu Glu Glu Pro Arg Thr Pro Glu Asn Val Gly Lys Ser Asn Gly
165 170 175

Arg Lys Arg Leu Glu Lys Thr Thr Pro Glu Ile Val Ser Ala Ser Pro
180 185 190

Ala Asn Ser Met Ala Trp Asp Tyr Phe Phe Met Val Glu Asn Met Pro
195 200 205

Gly Pro Asn Leu Asp Asp Arg Glu Val Arg Asn Gly Tyr Glu Asn Gln
210 215 220

Ser Ser His Phe Gln Phe Asn Glu Glu Asp Asp Glu Glu Glu Glu Glu
225 230 235 240

Glu Glu Arg Ser Gly Ile Tyr Arg Lys Lys Ser Gly Ser Gly Lys Val
245 250 255

Val Glu Glu Met Glu Pro Lys Thr Pro Glu Lys Val Glu Glu Glu Glu
260 265 270

Glu Glu Asp Glu Glu Glu Asp Glu Glu Glu Glu Glu Glu Glu Glu Glu
275 280 285

Glu Val Val Val Glu Val Lys Lys Lys Lys Lys Gly Lys Ala Lys Ile
290 295 300

Glu His Ser Ser Thr Ala Pro Pro Glu Phe Arg Arg Ala Val Ala Lys
305 310 315 320

Thr Ser Ala Ala Ala Ser Ser Ser Val Asn Leu Met Lys Ile Leu Asp
325 330 335

Glu Ile Asp Asp Arg Phe Leu Lys Ala Ser Glu Cys Ala Gln Glu Val
340 345 350

Ser Lys Met Leu Glu Ala Thr Arg Leu His Tyr His Ser Asn Phe Ala
355 360 365

Asp Asn Arg Gly Tyr Val Asp His Ser Ala Arg Val Met Arg Val Ile
370 375 380

Thr Trp Asn Lys Ser Leu Arg Gly Ile Ser Asn Gly Glu Gly Gly Lys
385 390 395 400

Asp Asp Gln Glu Ser Asp Glu His Glu Thr His Ala Thr Val Leu Asp
405 410 415

Lys Leu Leu Ala Trp Glu Lys Lys Leu Tyr Asp Glu Val Lys Gln Gly
420 425 430

Glu Leu Met Lys Ile Glu Tyr Gln Lys Lys Val Ser Leu Leu Asn Arg
435 440 445

His Lys Lys Arg Gly Ala Ser Ala Glu Thr Val Glu Lys Thr Lys Ala
450 455 460

Ala Val Ser His Leu His Thr Arg Tyr Ile Val Asp Met Gln Ser Met
465 470 475 480

Asp Ser Thr Val Ser Glu Val Asn Arg Leu Arg Asp Asp Gln Leu Tyr
485 490 495

Pro Arg Leu Val Ala Leu Val Glu Gly Met Ala Lys Met Trp Thr Asn
500 505 510

Met Cys Ile His His Asp Thr Gln Leu Gly Ile Val Gly Glu Leu Lys
515 520 525

Ala Leu Glu Ile Ser Thr Ser Leu Lys Glu Thr Thr Lys Gln His His
530 535 540

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His Gln Thr Arg Gln Phe Cys Thr Val Leu Glu Glu Trp His Val Gln
545                 550                 555                 560

Phe Asp Thr Leu Val Thr His Gln Lys Gln Tyr Ile Asn Ser Leu Asn
                565                 570                 575

Asn Trp Leu Lys Leu Asn Leu Ile Pro Ile Glu Ser Ser Leu Lys Glu
            580                 585                 590

Lys Val Ser Ser Pro Pro Arg Pro Gln Arg Pro Pro Ile Gln Ala Leu
        595                 600                 605

Leu His Ser Trp His Asp Arg Leu Glu Lys Leu Pro Asp Glu Val Ala
    610                 615                 620

Lys Ser Ala Ile Ser Ser Phe Ala Ala Val Ile Lys Thr Ile Leu Leu
625                 630                 635                 640

His Gln Glu Glu Glu Met Lys Leu Lys Glu Lys Cys Glu Glu Thr Arg
                645                 650                 655

Arg Glu Phe Ile Arg Lys Lys Gln Gly Phe Glu Asp Trp Tyr Gln Lys
            660                 665                 670

His Leu Gln Lys Arg Gly Pro Thr Glu Glu Ala Glu Gly Gly Asp Asp
        675                 680                 685

Ala Thr Thr Ser Ser Arg Asp His Val Thr Glu Arg Arg Ile Ala Val
    690                 695                 700

Glu Thr Leu Lys Lys Arg Leu Glu Glu Glu Glu Glu Ala His Gln Arg
705                 710                 715                 720

His Cys Val Gln Val Arg Glu Lys Ser Leu Asn Ser Leu Lys Ile Arg
                725                 730                 735

Leu Pro Glu Ile Phe Arg Ala Leu Ser Asp Tyr Ala His Ala Cys Ala
            740                 745                 750

Asp Ser Tyr Glu Lys Leu Arg Ile Ile Ser Gln Ser Gln Lys Ser Asn
        755                 760                 765

Gly Gly Ala Thr Glu Ser Ser
```

770 775

<210> 451 <211> 977 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (63)..(809) <223> G1808

<400> 451
aattcttccc ttttcccctt ctaatttctc tcatctctct attagaaaaa ttattagcaa 60

tt atg ttg tcc act gca ccg gcc ttt tca ttc tcc gaa ccg ggt ttg 107
Met Leu Ser Thr Ala Pro Ala Phe Ser Phe Ser Glu Pro Gly Leu
1 5 10 15

gtt aat caa ttc tcg ggt ttc caa acc ggg ttc act cct tgg gaa tgg 155
Val Asn Gln Phe Ser Gly Phe Gln Thr Gly Phe Thr Pro Trp Glu Trp
20 25 30

gat tgc tct gat ctc ttt ttc gtg gac caa atg tct ctt gaa ccg gcc 203
Asp Cys Ser Asp Leu Phe Phe Val Asp Gln Met Ser Leu Glu Pro Ala
35 40 45

atc cct agt cct tgt tat ggt gaa tcc gac act ggt tcc gtc aaa att 251
Ile Pro Ser Pro Cys Tyr Gly Glu Ser Asp Thr Gly Ser Val Lys Ile
50 55 60

aat tcc ggt tct cat gac atg aaa acc ggt tct gac gaa tct tgt gcc 299
Asn Ser Gly Ser His Asp Met Lys Thr Gly Ser Asp Glu Ser Cys Ala
65 70 75

ggt ttc gtc aaa att aat cct cgt tgt gac gac gcc gac ata tca aac 347
Gly Phe Val Lys Ile Asn Pro Arg Cys Asp Asp Ala Asp Ile Ser Asn
80 85 90 95

gat cta ccg tgc tct caa gca gat gaa ccg gac tcg gac gac aca aaa 395
Asp Leu Pro Cys Ser Gln Ala Asp Glu Pro Asp Ser Asp Asp Thr Lys
100 105 110

caa ttg aca gcc atc aca aat ttc ggt tcg gga gag aat aac cat aac 443
Gln Leu Thr Ala Ile Thr Asn Phe Gly Ser Gly Glu Asn Asn His Asn
115 120 125

cgg aaa aaa atg atc caa ccg gag atg acc gac gag cgg aag agg aag 491
Arg Lys Lys Met Ile Gln Pro Glu Met Thr Asp Glu Arg Lys Arg Lys
130 135 140

agg atg gag tca aac cgg gaa tca gcg aaa cgg tca aga atg cgt aaa 539
Arg Met Glu Ser Asn Arg Glu Ser Ala Lys Arg Ser Arg Met Arg Lys
145 150 155

caa agt cac att gat aac tta cga gag caa gta aac cgg ttg gat tta 587
Gln Ser His Ile Asp Asn Leu Arg Glu Gln Val Asn Arg Leu Asp Leu
160 165 170 175

gaa aac cgt gag ctc ggg aac cga ctc cgg tta gtt tta cac cag ctt 635
Glu Asn Arg Glu Leu Gly Asn Arg Leu Arg Leu Val Leu His Gln Leu
180 185 190

caa cga gtg aat tcc gac aat aac cgg ctc gtg aca gaa caa gag ata 683
Gln Arg Val Asn Ser Asp Asn Asn Arg Leu Val Thr Glu Gln Glu Ile
195 200 205

ctc cgg cta aga ttg tcg gag atg cgt cgg att ctg atc att aga caa 731
Leu Arg Leu Arg Leu Ser Glu Met Arg Arg Ile Leu Ile Ile Arg Gln
210 215 220

ctt caa caa cag caa caa tgg gaa cta cat aac cgg aga atg atc atg 779
Leu Gln Gln Gln Gln Gln Trp Glu Leu His Asn Arg Arg Met Ile Met
225 230 235

act gaa caa aac cac cct cat ctt caa tga tagatcaaaa tatttaagaa 829
Thr Glu Gln Asn His Pro His Leu Gln
240 245

gaaaaaatat cgaaaaactt agaacaataa ccaaaaaaaa aaagcaaagc aaaaaagaaa 889

ctctcgctat gtctctctat ctctctatgt aaatgaaatg aaggttagga agagaaaatg 949

atagttttct aattttcctt tccacttt 977

<210> 452 <211> 248 <212> PRT <213> Arabidopsis thaliana <400> 452

Met Leu Ser Thr Ala Pro Ala Phe Ser Phe Ser Glu Pro Gly Leu Val
1 5 10 15

Asn Gln Phe Ser Gly Phe Gln Thr Gly Phe Thr Pro Trp Glu Trp Asp
20 25 30

Cys Ser Asp Leu Phe Phe Val Asp Gln Met Ser Leu Glu Pro Ala Ile
35 40 45

Pro Ser Pro Cys Tyr Gly Glu Ser Asp Thr Gly Ser Val Lys Ile Asn
50 55 60

Ser Gly Ser His Asp Met Lys Thr Gly Ser Asp Glu Ser Cys Ala Gly
65 70 75 80

Phe Val Lys Ile Asn Pro Arg Cys Asp Asp Ala Asp Ile Ser Asn Asp
85 90 95

Leu Pro Cys Ser Gln Ala Asp Glu Pro Asp Ser Asp Asp Thr Lys Gln
100 105 110

Leu Thr Ala Ile Thr Asn Phe Gly Ser Gly Glu Asn Asn His Asn Arg
115 120 125

Lys Lys Met Ile Gln Pro Glu Met Thr Asp Glu Arg Lys Arg Lys Arg
130 135 140

Met Glu Ser Asn Arg Glu Ser Ala Lys Arg Ser Arg Met Arg Lys Gln
145 150 155 160

Ser His Ile Asp Asn Leu Arg Glu Gln Val Asn Arg Leu Asp Leu Glu
165 170 175

Asn Arg Glu Leu Gly Asn Arg Leu Arg Leu Val Leu His Gln Leu Gln
180 185 190

Arg Val Asn Ser Asp Asn Asn Arg Leu Val Thr Glu Gln Glu Ile Leu
195 200 205

Arg Leu Arg Leu Ser Glu Met Arg Arg Ile Leu Ile Ile Arg Gln Leu
210 215 220

Gln Gln Gln Gln Gln Trp Glu Leu His Asn Arg Arg Met Ile Met Thr
225 230 235 240

Glu Gln Asn His Pro His Leu Gln
245

<210> 453 <211> 1740 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (601)..(1161) <223> G1818

<400> 453
taacaaatca aataattaga gaaataacca aaatttaact tttagaggga ctacaggatt 60

tgtactttgt acattcatat attattgtta tatatcgttt catacattaa tttgaaccaa 120

tgtaaattaa gtaaaattca atttaacatc atgagcaaat tcttattaaa attctcttaa 180

aattttgagc aaattatgct ttcacattta acatttgaaa acatcatttt taacaagata 240

ttcaaaacta agttttgtac agcaaaattt taactttcaa ttttatagag aaaaaggtat 300

ttttttttt gtttcatttt tataagacta ttatttggta tataatatac actttaagta 360

aaaacaaatc tctttctttt ttcttcttat aataccaacc acaagtctgt cagtcacaca 420

catacagtta ataacattaa atattcttaa caaactacta aataggttga gattcatata 480

tgtaaagaga tcacttctta atcttatcct accatatctt atatacgctt aattttcctt 540

tatatatgca aacctccaca taaaaatatc tcaaacccaa acacttcaaa caaaaaaaaa 600

atg gag aac aac aac aac aac cac caa cag cca ccg aaa gat aac gag 648

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Met Glu Asn Asn Asn Asn Asn His Gln Gln Pro Pro Lys Asp Asn Glu
1               5                   10                  15

caa cta aag agt ttc tgg tca aag ggg atg gaa ggt gac ttg aat gtc      696
Gln Leu Lys Ser Phe Trp Ser Lys Gly Met Glu Gly Asp Leu Asn Val
            20                  25                  30

aag aat cac gag ttc ccc atc tct cgt atc aag agg ata atg aag ttt      744
Lys Asn His Glu Phe Pro Ile Ser Arg Ile Lys Arg Ile Met Lys Phe
        35                  40                  45

gat ccg gat gtg agt atg atc gct gct gag gct cca aat ctc tta tct      792
Asp Pro Asp Val Ser Met Ile Ala Ala Glu Ala Pro Asn Leu Leu Ser
    50                  55                  60

aag gct tgt gaa atg ttt gtc atg gac ctc acg atg cgt tca tgg ctc      840
Lys Ala Cys Glu Met Phe Val Met Asp Leu Thr Met Arg Ser Trp Leu
65                  70                  75                  80

cat gct caa gag agc aac cga ctc acg ata cgg aaa tct gat gtt gat      888
His Ala Gln Glu Ser Asn Arg Leu Thr Ile Arg Lys Ser Asp Val Asp
                85                  90                  95

gcc gta gtg tct caa acc gtc atc ttt gat ttc ttg cgt gat gat gtc      936
Ala Val Val Ser Gln Thr Val Ile Phe Asp Phe Leu Arg Asp Asp Val
            100                 105                 110

cct aag gac gag gga gag ccc gtt gtc gcc gct gct gat cct gtg gac      984
Pro Lys Asp Glu Gly Glu Pro Val Val Ala Ala Ala Asp Pro Val Asp
        115                 120                 125

gat gtt gct gat cat gtg gct gtg cca gat ctt aac aat gaa gaa ctg     1032
Asp Val Ala Asp His Val Ala Val Pro Asp Leu Asn Asn Glu Glu Leu
    130                 135                 140

ccg ccg gga acg gtg ata gga act ccg gtt tgt tac ggt tta gga ata     1080
Pro Pro Gly Thr Val Ile Gly Thr Pro Val Cys Tyr Gly Leu Gly Ile
145                 150                 155                 160

cac gcg cca cac ccg cag atg cct gga gct tgg acc gag gag gat gcg     1128
His Ala Pro His Pro Gln Met Pro Gly Ala Trp Thr Glu Glu Asp Ala
                165                 170                 175

act ggg gca aat gga gga aac ggt ggg aat taa tatttggatt gggttttgta   1181
Thr Gly Ala Asn Gly Gly Asn Gly Gly Asn
            180                 185

accgctgttg tgagaacttg aatttctttt tgagttctgc ttatgttttc aatgttatgt   1241

tttttagttg ttgaatgtat ttctgttgtt ttgtccaaaa aaaaaaaaga atgtatttct   1301

gttgttgtct ttcaaatgaa tctaatggtt tatgaatatt ggctttagat taatttatgc   1361

atacaaaaac acaaggatta cggataaaaa agtcctcagt ttacccatgg aaacataatc   1421

ttctagtgat tccttatgag agtagaaaag aatcatatat tataatctat ttcataagag   1481
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Substitute Sheet (Rule 26)

atagggtact gtaaacaagg atgtttattc ggctatttct ttttttttta atcactttta 1541

cttgtcaaga ctcttttgtg tttgcagctt tttgttagat tacattctag aggcaacaag 1601

atccagagat ctagcaaaaa aaacttattt tgaaacctga atctatttta aaaattttcc 1661

aactcatttt tcgttcttat tctttgtttt ccaacggaat ttggcgcaca aacgatttat 1721

ttgaattttg tctttcaag 1740

<210> 454 <211> 186 <212> PRT <213> Arabidopsis thaliana <400> 454

Met Glu Asn Asn Asn Asn Asn His Gln Gln Pro Pro Lys Asp Asn Glu
1 5 10 15

Gln Leu Lys Ser Phe Trp Ser Lys Gly Met Glu Gly Asp Leu Asn Val
20 25 30

Lys Asn His Glu Phe Pro Ile Ser Arg Ile Lys Arg Ile Met Lys Phe
35 40 45

Asp Pro Asp Val Ser Met Ile Ala Ala Glu Ala Pro Asn Leu Leu Ser
50 55 60

Lys Ala Cys Glu Met Phe Val Met Asp Leu Thr Met Arg Ser Trp Leu
65 70 75 80

His Ala Gln Glu Ser Asn Arg Leu Thr Ile Arg Lys Ser Asp Val Asp
85 90 95

Ala Val Val Ser Gln Thr Val Ile Phe Asp Phe Leu Arg Asp Asp Val
100 105 110

Pro Lys Asp Glu Gly Glu Pro Val Val Ala Ala Ala Asp Pro Val Asp
115 120 125

Asp Val Ala Asp His Val Ala Val Pro Asp Leu Asn Asn Glu Glu Leu
130 135 140

Pro Pro Gly Thr Val Ile Gly Thr Pro Val Cys Tyr Gly Leu Gly Ile
145 150 155 160

His Ala Pro His Pro Gln Met Pro Gly Ala Trp Thr Glu Glu Asp Ala
165 170 175

Thr Gly Ala Asn Gly Gly Asn Gly Gly Asn
180 185

<210> 455 <211> 639 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(639) <223> G1819

<400> 455

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atg gaa gag aac aac ggc aac aac aac cac tac ctg ccg caa cca tcg       48
Met Glu Glu Asn Asn Gly Asn Asn Asn His Tyr Leu Pro Gln Pro Ser
1               5                   10                  15

tct tcc caa ctg ccg ccg cca cca ttg tat tat caa tca atg ccg ttg       96
Ser Ser Gln Leu Pro Pro Pro Pro Leu Tyr Tyr Gln Ser Met Pro Leu
            20                  25                  30

ccg tca tat tca ctg ccg ctg ccg tac tca ccg cag atg cgg aat tat      144
Pro Ser Tyr Ser Leu Pro Leu Pro Tyr Ser Pro Gln Met Arg Asn Tyr
        35                  40                  45

tgg att gcg cag atg gga aac gca act gat gtt aag cat cat gcg ttt      192
Trp Ile Ala Gln Met Gly Asn Ala Thr Asp Val Lys His His Ala Phe
    50                  55                  60

cca cta acc agg ata aag aaa atc atg aag tcc aac ccg gaa gtg aac      240
Pro Leu Thr Arg Ile Lys Lys Ile Met Lys Ser Asn Pro Glu Val Asn
65                  70                  75                  80

atg gtc act gca gag gct ccg gtc ctt ata tcg aag gcc tgt gag atg      288
Met Val Thr Ala Glu Ala Pro Val Leu Ile Ser Lys Ala Cys Glu Met
                85                  90                  95

ctc att ctt gat ctc aca atg cga tcg tgg ctt cat acc gtg gag ggc      336
Leu Ile Leu Asp Leu Thr Met Arg Ser Trp Leu His Thr Val Glu Gly
            100                 105                 110

ggt cgc caa act ctc aag aga tcc gat acg ctc acg aga tcc gat atc      384
Gly Arg Gln Thr Leu Lys Arg Ser Asp Thr Leu Thr Arg Ser Asp Ile
        115                 120                 125

tcc gcc gca acg act cgt agt ttc aaa ttt acc ttc ctt ggc gac gtt      432
Ser Ala Ala Thr Thr Arg Ser Phe Lys Phe Thr Phe Leu Gly Asp Val
    130                 135                 140

gtc cca aga gac cct tcc gtc gtt acc gat gat ccc gtg cta cat ccg      480
Val Pro Arg Asp Pro Ser Val Val Thr Asp Asp Pro Val Leu His Pro
145                 150                 155                 160

gac ggt gaa gta ctt cct ccg gga acg gtg ata gga tat ccg gtg ttt      528
Asp Gly Glu Val Leu Pro Pro Gly Thr Val Ile Gly Tyr Pro Val Phe
                165                 170                 175

gat tgt aat ggt gtg tac gcg tca ccg cca cag atg cag gag tgg ccg      576
Asp Cys Asn Gly Val Tyr Ala Ser Pro Pro Gln Met Gln Glu Trp Pro
            180                 185                 190

gcg gtg cct ggt gac gga gag gag gca gct ggg gaa att gga gga agc      624
```

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```
Ala Val Pro Gly Asp Gly Glu Glu Ala Ala Gly Glu Ile Gly Gly Ser
        195                 200                 205

agc ggc ggt aat tga                                                 639
Ser Gly Gly Asn
    210
```

<210> 456 <211> 212 <212> PRT <213> Arabidopsis thaliana <400> 456

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Met Glu Glu Asn Asn Gly Asn Asn Asn His Tyr Leu Pro Gln Pro Ser
1               5                   10                  15

Ser Ser Gln Leu Pro Pro Pro Pro Leu Tyr Tyr Gln Ser Met Pro Leu
            20                  25                  30

Pro Ser Tyr Ser Leu Pro Leu Pro Tyr Ser Pro Gln Met Arg Asn Tyr
        35                  40                  45

Trp Ile Ala Gln Met Gly Asn Ala Thr Asp Val Lys His His Ala Phe
    50                  55                  60

Pro Leu Thr Arg Ile Lys Lys Ile Met Lys Ser Asn Pro Glu Val Asn
65                  70                  75                  80

Met Val Thr Ala Glu Ala Pro Val Leu Ile Ser Lys Ala Cys Glu Met
                85                  90                  95

Leu Ile Leu Asp Leu Thr Met Arg Ser Trp Leu His Thr Val Glu Gly
            100                 105                 110

Gly Arg Gln Thr Leu Lys Arg Ser Asp Thr Leu Thr Arg Ser Asp Ile
        115                 120                 125

Ser Ala Ala Thr Thr Arg Ser Phe Lys Phe Thr Phe Leu Gly Asp Val
    130                 135                 140

Val Pro Arg Asp Pro Ser Val Val Thr Asp Asp Pro Val Leu His Pro
145                 150                 155                 160

Asp Gly Glu Val Leu Pro Pro Gly Thr Val Ile Gly Tyr Pro Val Phe
                165                 170                 175

Asp Cys Asn Gly Val Tyr Ala Ser Pro Pro Gln Met Gln Glu Trp Pro
            180                 185                 190
```

```
Ala Val Pro Gly Asp Gly Glu Glu Ala Ala Gly Glu Ile Gly Gly Ser
        195                 200                 205

Ser Gly Gly Asn
    210
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<210> 457 <211> 954 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(954) <223> G1895

<400> 457

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atg aat aac caa tct gtt act gac aat aca agt ctt aag ctg tca tct       48
Met Asn Asn Gln Ser Val Thr Asp Asn Thr Ser Leu Lys Leu Ser Ser
1               5                   10                  15

aat ctt aac aac gag tca aaa gaa aca tct gag aac agt gat gac caa       96
Asn Leu Asn Asn Glu Ser Lys Glu Thr Ser Glu Asn Ser Asp Asp Gln
            20                  25                  30

cac agc gag atc aca aca att aca tcg gaa gaa gag aaa aca act gaa      144
His Ser Glu Ile Thr Thr Ile Thr Ser Glu Glu Glu Lys Thr Thr Glu
        35                  40                  45

ctg aag aaa cca gac aag att ctt cca tgt ccg aga tgc aac agc gca      192
Leu Lys Lys Pro Asp Lys Ile Leu Pro Cys Pro Arg Cys Asn Ser Ala
    50                  55                  60

gac acc aaa ttc tgt tac tac aac aac tac aac gtt aac cag cca cgt      240
Asp Thr Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln Pro Arg
65                  70                  75                  80

cac ttc tgt aga aaa tgc cag agg tat tgg acc gct ggt gga tcc atg      288
His Phe Cys Arg Lys Cys Gln Arg Tyr Trp Thr Ala Gly Gly Ser Met
                85                  90                  95

agg atc gtc ccg gtt ggc tca ggc cgt cgc aag aac aag gga tgg gtt      336
Arg Ile Val Pro Val Gly Ser Gly Arg Arg Lys Asn Lys Gly Trp Val
            100                 105                 110

tct tca gac cag tac ctg cac atc act tcc gag gat act gac aat tac      384
Ser Ser Asp Gln Tyr Leu His Ile Thr Ser Glu Asp Thr Asp Asn Tyr
        115                 120                 125

aat agc tcc tca aca aag att cta agc ttc gag tct tcg gac tct ttg      432
Asn Ser Ser Ser Thr Lys Ile Leu Ser Phe Glu Ser Ser Asp Ser Leu
    130                 135                 140

gta act gag agg cct aag cat caa tca aac gaa gtg aag ata aac gct      480
Val Thr Glu Arg Pro Lys His Gln Ser Asn Glu Val Lys Ile Asn Ala
145                 150                 155                 160

gaa cct gtt tca caa gaa ccc aac aac ttc caa ggg tta ctt cct ccc      528
Glu Pro Val Ser Gln Glu Pro Asn Asn Phe Gln Gly Leu Leu Pro Pro
                165                 170                 175
```

caa gca tcc cct gtt tcg cct cct tgg cct tac caa tac cct cca aac 576
Gln Ala Ser Pro Val Ser Pro Pro Trp Pro Tyr Gln Tyr Pro Pro Asn
180 185 190

cct agt ttc tac cac atg ccc gtc tac tgg ggc tgc gcg ata ccg gtt 624
Pro Ser Phe Tyr His Met Pro Val Tyr Trp Gly Cys Ala Ile Pro Val
195 200 205

tgg tct acc ctc gac act tct aca tgt ctt ggg aaa agg aca aga gac 672
Trp Ser Thr Leu Asp Thr Ser Thr Cys Leu Gly Lys Arg Thr Arg Asp
210 215 220

gaa act tct cat gaa act gtt aaa gag agt aaa aat gct ttt gag aga 720
Glu Thr Ser His Glu Thr Val Lys Glu Ser Lys Asn Ala Phe Glu Arg
225 230 235 240

aca agc ttg ctt ttg gaa tct cag agc atc aaa aat gaa aca agt atg 768
Thr Ser Leu Leu Leu Glu Ser Gln Ser Ile Lys Asn Glu Thr Ser Met
245 250 255

gct aca aat aac cat gtg tgg tat cca gta ccg atg acc cgc gag aag 816
Ala Thr Asn Asn His Val Trp Tyr Pro Val Pro Met Thr Arg Glu Lys
260 265 270

aca caa gaa ttc agc ttt ttc agt aat gga gct gaa aca aag agc agc 864
Thr Gln Glu Phe Ser Phe Phe Ser Asn Gly Ala Glu Thr Lys Ser Ser
275 280 285

aac aac aga ttc gtc cct gaa acg tat ctt aac ctg caa gca aac cct 912
Asn Asn Arg Phe Val Pro Glu Thr Tyr Leu Asn Leu Gln Ala Asn Pro
290 295 300

gca gcc atg gca aga tct atg aac ttc aga gag agc ata taa 954
Ala Ala Met Ala Arg Ser Met Asn Phe Arg Glu Ser Ile
305 310 315

<210> 458 <211> 317 <212> PRT <213> Arabidopsis thaliana <400> 458

Met Asn Asn Gln Ser Val Thr Asp Asn Thr Ser Leu Lys Leu Ser Ser
1 5 10 15

Asn Leu Asn Asn Glu Ser Lys Glu Thr Ser Glu Asn Ser Asp Asp Gln
20 25 30

His Ser Glu Ile Thr Thr Ile Thr Ser Glu Glu Glu Lys Thr Thr Glu
35 40 45

Leu Lys Lys Pro Asp Lys Ile Leu Pro Cys Pro Arg Cys Asn Ser Ala
50 55 60

Asp Thr Lys Phe Cys Tyr Tyr Asn Asn Tyr Asn Val Asn Gln Pro Arg
65 70 75 80

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```
His Phe Cys Arg Lys Cys Gln Arg Tyr Trp Thr Ala Gly Gly Ser Met
                85                  90                  95

Arg Ile Val Pro Val Gly Ser Gly Arg Arg Lys Asn Lys Gly Trp Val
            100                 105                 110

Ser Ser Asp Gln Tyr Leu His Ile Thr Ser Glu Asp Thr Asp Asn Tyr
        115                 120                 125

Asn Ser Ser Ser Thr Lys Ile Leu Ser Phe Glu Ser Ser Asp Ser Leu
    130                 135                 140

Val Thr Glu Arg Pro Lys His Gln Ser Asn Glu Val Lys Ile Asn Ala
145                 150                 155                 160

Glu Pro Val Ser Gln Glu Pro Asn Asn Phe Gln Gly Leu Leu Pro Pro
                165                 170                 175

Gln Ala Ser Pro Val Ser Pro Pro Trp Pro Tyr Gln Tyr Pro Pro Asn
            180                 185                 190

Pro Ser Phe Tyr His Met Pro Val Tyr Trp Gly Cys Ala Ile Pro Val
        195                 200                 205

Trp Ser Thr Leu Asp Thr Ser Thr Cys Leu Gly Lys Arg Thr Arg Asp
    210                 215                 220

Glu Thr Ser His Glu Thr Val Lys Glu Ser Lys Asn Ala Phe Glu Arg
225                 230                 235                 240

Thr Ser Leu Leu Leu Glu Ser Gln Ser Ile Lys Asn Glu Thr Ser Met
                245                 250                 255

Ala Thr Asn Asn His Val Trp Tyr Pro Val Pro Met Thr Arg Glu Lys
            260                 265                 270

Thr Gln Glu Phe Ser Phe Phe Ser Asn Gly Ala Glu Thr Lys Ser Ser
        275                 280                 285

Asn Asn Arg Phe Val Pro Glu Thr Tyr Leu Asn Leu Gln Ala Asn Pro
    290                 295                 300
```

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Ala Ala Met Ala Arg Ser Met Asn Phe Arg Glu Ser Ile
305                 310                 315
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<210> 459 <211> 658 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (5)..(592) <223> G1931

<400> 459

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atca atg gaa ggg gtt gac aac aca aat cct atg tta acc cta gaa gaa      49
     Met Glu Gly Val Asp Asn Thr Asn Pro Met Leu Thr Leu Glu Glu
     1               5                   10                  15

ggc gaa aac aac aat cct ttt tct tcc tta gat gac aaa aca tta atg      97
Gly Glu Asn Asn Asn Pro Phe Ser Ser Leu Asp Asp Lys Thr Leu Met
                20                  25                  30

atg atg gct cct tcg tta atc ttt tcg ggc gat gta ggt cca tct tct     145
Met Met Ala Pro Ser Leu Ile Phe Ser Gly Asp Val Gly Pro Ser Ser
            35                  40                  45

tct tct tgt act cca gca ggt tat cat cta tct gct cag ctg gag aac     193
Ser Ser Cys Thr Pro Ala Gly Tyr His Leu Ser Ala Gln Leu Glu Asn
        50                  55                  60

ttt cga gga ggt gga gga gag atg gga gga tta gtg agt aat aat agc     241
Phe Arg Gly Gly Gly Gly Glu Met Gly Gly Leu Val Ser Asn Asn Ser
    65                  70                  75

aat aat agt gat cat aat aag aat tgc aac aaa gga aaa ggg aag aga     289
Asn Asn Ser Asp His Asn Lys Asn Cys Asn Lys Gly Lys Gly Lys Arg
80                  85                  90                  95

act ttg gca atg cag agg ata gct ttt cat aca agg agt gat gat gat     337
Thr Leu Ala Met Gln Arg Ile Ala Phe His Thr Arg Ser Asp Asp Asp
                100                 105                 110

gtt ctt gat gat ggt tat cgt tgg cga aag tac ggt cag aaa tct gtc     385
Val Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ser Val
            115                 120                 125

aag aac aat gct cat ccc agg agc tat tat aga tgt aca tac cac aca     433
Lys Asn Asn Ala His Pro Arg Ser Tyr Tyr Arg Cys Thr Tyr His Thr
        130                 135                 140

tgc aac gtg aag aaa caa gtg caa aga ctg gca aaa gat cca aac gtt     481
Cys Asn Val Lys Lys Gln Val Gln Arg Leu Ala Lys Asp Pro Asn Val
    145                 150                 155

gtc gta aca acc tac gaa ggt gtt cat aat cat cct tgt gag aag ctc     529
Val Val Thr Thr Tyr Glu Gly Val His Asn His Pro Cys Glu Lys Leu
160                 165                 170                 175

atg gag act ctt agc cct ctc ctt agg caa ctt cag ttc ctc tca aga     577
Met Glu Thr Leu Ser Pro Leu Leu Arg Gln Leu Gln Phe Leu Ser Arg
                180                 185                 190
```

gtt tct gat ctg taa ttattgaatg ttaattagtg gtgtaataca ttaattatgc 632
Val Ser Asp Leu
195

tttaatctct ccattgaccc tcaatc 658

<210> 460 <211> 195 <212> PRT <213> Arabidopsis thaliana <400> 460

Met Glu Gly Val Asp Asn Thr Asn Pro Met Leu Thr Leu Glu Glu Gly
1 5 10 15

Glu Asn Asn Asn Pro Phe Ser Ser Leu Asp Asp Lys Thr Leu Met Met
20 25 30

Met Ala Pro Ser Leu Ile Phe Ser Gly Asp Val Gly Pro Ser Ser Ser
35 40 45

Ser Cys Thr Pro Ala Gly Tyr His Leu Ser Ala Gln Leu Glu Asn Phe
50 55 60

Arg Gly Gly Gly Gly Glu Met Gly Gly Leu Val Ser Asn Asn Ser Asn
65 70 75 80

Asn Ser Asp His Asn Lys Asn Cys Asn Lys Gly Lys Gly Lys Arg Thr
85 90 95

Leu Ala Met Gln Arg Ile Ala Phe His Thr Arg Ser Asp Asp Asp Val
100 105 110

Leu Asp Asp Gly Tyr Arg Trp Arg Lys Tyr Gly Gln Lys Ser Val Lys
115 120 125

Asn Asn Ala His Pro Arg Ser Tyr Tyr Arg Cys Thr Tyr His Thr Cys
130 135 140

Asn Val Lys Lys Gln Val Gln Arg Leu Ala Lys Asp Pro Asn Val Val
145 150 155 160

Val Thr Thr Tyr Glu Gly Val His Asn His Pro Cys Glu Lys Leu Met
165 170 175

Glu Thr Leu Ser Pro Leu Leu Arg Gln Leu Gln Phe Leu Ser Arg Val
180 185 190

Replacement Sheet

Ser Asp Leu
195

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<222> (92)..(844) <223> G1939

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aaaagaaaac actaaaccca gatcgaaaac c atg tct att aac aac aac aac 112
Met Ser Ile Asn Asn Asn Asn
1 5

aac aac aac aac aat aac aac gat ggt ctt atg atc tca tca aac gga 160
Asn Asn Asn Asn Asn Asn Asn Asp Gly Leu Met Ile Ser Ser Asn Gly
10 15 20

gct tta atc gaa caa caa cca tca gtc gtt gtg aag aaa cca ccg gcg 208
Ala Leu Ile Glu Gln Gln Pro Ser Val Val Val Lys Lys Pro Pro Ala
25 30 35

aaa gat cga cat agc aaa gtc gat gga aga ggg aga aga atc cgt atg 256
Lys Asp Arg His Ser Lys Val Asp Gly Arg Gly Arg Arg Ile Arg Met
40 45 50 55

ccg att ata tgt gct gct cgt gtt ttt cag cta acg aga gag ctt ggt 304
Pro Ile Ile Cys Ala Ala Arg Val Phe Gln Leu Thr Arg Glu Leu Gly
60 65 70

cat aag tca gat ggc caa aca att gaa tgg tta ctt cgt caa gca gag 352
His Lys Ser Asp Gly Gln Thr Ile Glu Trp Leu Leu Arg Gln Ala Glu
75 80 85

cct tct att ata gct gca aca gga act ggt aca act cca gcg agt ttc 400
Pro Ser Ile Ile Ala Ala Thr Gly Thr Gly Thr Thr Pro Ala Ser Phe
90 95 100

tca act gct tct gtc tct atc cgt gga gcc acc aat tct act tct tta 448
Ser Thr Ala Ser Val Ser Ile Arg Gly Ala Thr Asn Ser Thr Ser Leu
105 110 115

gat cat aaa ccc act tct tta ctt ggt ggt acg tca ccg ttt ata ctt 496
Asp His Lys Pro Thr Ser Leu Leu Gly Gly Thr Ser Pro Phe Ile Leu
120 125 130 135

ggg aaa cgt gtt aga gct gat gag gat agt aat aat agt cat aat cat 544
Gly Lys Arg Val Arg Ala Asp Glu Asp Ser Asn Asn Ser His Asn His
140 145 150

agt tct gtt ggt aaa gat gag acc ttt acg aca aca cca gct ggg ttt 592
Ser Ser Val Gly Lys Asp Glu Thr Phe Thr Thr Thr Pro Ala Gly Phe
155 160 165

tgg gct gtt ccg gcg agg ccg gat ttt gga caa gtt tgg agt ttt gct 640
Trp Ala Val Pro Ala Arg Pro Asp Phe Gly Gln Val Trp Ser Phe Ala
170 175 180

gga gct cca caa gag atg ttt tta caa caa caa cat cat cat cag caa 688
Gly Ala Pro Gln Glu Met Phe Leu Gln Gln Gln His His His Gln Gln
185 190 195

cca ttg ttt gtt cat cag caa cag caa caa caa gct gca atg ggt gaa 736
Pro Leu Phe Val His Gln Gln Gln Gln Gln Gln Ala Ala Met Gly Glu
200 205 210 215

gct tct gct gct aga gtt ggg aat tat ctt ccg ggt cat ctt aat ttg 784
Ala Ser Ala Ala Arg Val Gly Asn Tyr Leu Pro Gly His Leu Asn Leu
220 225 230

ctt gct tct tta tcc ggt gga tct ccc ggg tcg gat cga aga gag gaa 832
Leu Ala Ser Leu Ser Gly Gly Ser Pro Gly Ser Asp Arg Arg Glu Glu
235 240 245

gat cca cgt taa tggtttaagc ccttttaggt ttgagggcaa aatttggtat 884
Asp Pro Arg
250

atatatttat tatcttctct tctctattgt tgtcattgtt tctctatgtg tgtgttttag 944

tgttgttaga gattgatttg gtttcagaat ctctgcaagt gatttgagag ttttcgttag 1004

ctttaagtaa gttaaagacg gttgtttttg attagggtta aattagggtt taagaatctg 1064

ttgttttttt ggagggagat cgatttctta tcggatccaa gattactttt aggaaaaaag 1124

ggaaaatttc agaaaccacg gtggtttctt ttcctctttt tttttttg 1172

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Met Ser Ile Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asp Gly
1 5 10 15

Leu Met Ile Ser Ser Asn Gly Ala Leu Ile Glu Gln Gln Pro Ser Val
20 25 30

Val Val Lys Lys Pro Pro Ala Lys Asp Arg His Ser Lys Val Asp Gly
35 40 45

Arg Gly Arg Arg Ile Arg Met Pro Ile Ile Cys Ala Ala Arg Val Phe
50 55 60

Gln Leu Thr Arg Glu Leu Gly His Lys Ser Asp Gly Gln Thr Ile Glu
65 70 75 80

Trp Leu Leu Arg Gln Ala Glu Pro Ser Ile Ile Ala Ala Thr Gly Thr
85 90 95

Gly Thr Thr Pro Ala Ser Phe Ser Thr Ala Ser Val Ser Ile Arg Gly
100 105 110

Ala Thr Asn Ser Thr Ser Leu Asp His Lys Pro Thr Ser Leu Leu Gly
115 120 125

Gly Thr Ser Pro Phe Ile Leu Gly Lys Arg Val Arg Ala Asp Glu Asp
130 135 140

Ser Asn Asn Ser His Asn His Ser Ser Val Gly Lys Asp Glu Thr Phe
145 150 155 160

Thr Thr Thr Pro Ala Gly Phe Trp Ala Val Pro Ala Arg Pro Asp Phe
165 170 175

Gly Gln Val Trp Ser Phe Ala Gly Ala Pro Gln Glu Met Phe Leu Gln
180 185 190

Gln Gln His His His Gln Gln Pro Leu Phe Val His Gln Gln Gln Gln
195 200 205

Gln Gln Ala Ala Met Gly Glu Ala Ser Ala Ala Arg Val Gly Asn Tyr
210 215 220

Leu Pro Gly His Leu Asn Leu Leu Ala Ser Leu Ser Gly Gly Ser Pro
225 230 235 240

Gly Ser Asp Arg Arg Glu Glu Asp Pro Arg
245 250

<210> 463 <211> 513 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(513) <223> G1974

<400> 463
atg gtt gct gaa agt gat aat cgt gat ctg acg gtg gat acg gcg gcg 48
Met Val Ala Glu Ser Asp Asn Arg Asp Leu Thr Val Asp Thr Ala Ala
1 5 10 15

agc tgt ctg atg ttg tta tca gga att gga gaa cac gac gga aga aag 96
Ser Cys Leu Met Leu Leu Ser Gly Ile Gly Glu His Asp Gly Arg Lys
20 25 30

aaa cgt gtt ttc cga tgc aag act tgt gag aga gac ttc gat tcg ttc 144
Lys Arg Val Phe Arg Cys Lys Thr Cys Glu Arg Asp Phe Asp Ser Phe
35 40 45

```
caa gct tta gga ggc cac cgt gca agc cac tcg aaa cta acc aac agt      192
Gln Ala Leu Gly Gly His Arg Ala Ser His Ser Lys Leu Thr Asn Ser
    50                  55                  60

gac gat aaa tca ctt cct gga tca cca aag aag aag cct aaa act acg      240
Asp Asp Lys Ser Leu Pro Gly Ser Pro Lys Lys Lys Pro Lys Thr Thr
65                  70                  75                  80

act acg acg acg gct cat act tgt ccg att tgt ggc ttg gag ttt ccg      288
Thr Thr Thr Thr Ala His Thr Cys Pro Ile Cys Gly Leu Glu Phe Pro
                85                  90                  95

atg gga caa gct ctt ggt ggt cac atg agg aaa cat agg aac gag aaa      336
Met Gly Gln Ala Leu Gly Gly His Met Arg Lys His Arg Asn Glu Lys
            100                 105                 110

gaa cga gaa aag gct tct aac gta ttg gtt acg cat tct ttc atg ccg      384
Glu Arg Glu Lys Ala Ser Asn Val Leu Val Thr His Ser Phe Met Pro
        115                 120                 125

gag acg aca acg gtg acg act ttg aag aaa tcg agt agt ggg aag aga      432
Glu Thr Thr Thr Val Thr Thr Leu Lys Lys Ser Ser Ser Gly Lys Arg
    130                 135                 140

gtg gcg tgt ttg gat ttc gac tta act tcg gtg gag agc ttt gtc aac      480
Val Ala Cys Leu Asp Phe Asp Leu Thr Ser Val Glu Ser Phe Val Asn
145                 150                 155                 160

acg gaa ttg gag ttg gga aga acg atg tac tga                          513
Thr Glu Leu Glu Leu Gly Arg Thr Met Tyr
                165                 170
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<210> 464 <211> 170 <212> PRT <213> Arabidopsis thaliana <400> 464

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Met Val Ala Glu Ser Asp Asn Arg Asp Leu Thr Val Asp Thr Ala Ala
1               5                   10                  15

Ser Cys Leu Met Leu Leu Ser Gly Ile Gly Glu His Asp Gly Arg Lys
            20                  25                  30

Lys Arg Val Phe Arg Cys Lys Thr Cys Glu Arg Asp Phe Asp Ser Phe
        35                  40                  45

Gln Ala Leu Gly Gly His Arg Ala Ser His Ser Lys Leu Thr Asn Ser
    50                  55                  60

Asp Asp Lys Ser Leu Pro Gly Ser Pro Lys Lys Lys Pro Lys Thr Thr
65                  70                  75                  80

Thr Thr Thr Thr Ala His Thr Cys Pro Ile Cys Gly Leu Glu Phe Pro
                85                  90                  95
```

Met Gly Gln Ala Leu Gly Gly His Met Arg Lys His Arg Asn Glu Lys
100 105 110

Glu Arg Glu Lys Ala Ser Asn Val Leu Val Thr His Ser Phe Met Pro
115 120 125

Glu Thr Thr Thr Val Thr Thr Leu Lys Lys Ser Ser Ser Gly Lys Arg
130 135 140

Val Ala Cys Leu Asp Phe Asp Leu Thr Ser Val Glu Ser Phe Val Asn
145 150 155 160

Thr Glu Leu Glu Leu Gly Arg Thr Met Tyr
165 170

<210> 465 <211> 1536 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (42)..(1487) <223> G2105

<400> 465
ctctctgact tgaactcttc tcttctaccg aatcaaacca a atg gag gat cat caa 56
Met Glu Asp His Gln
1 5

aac cat cca cag tac ggt ata gaa caa cca tct tct caa ttc tcc tct 104
Asn His Pro Gln Tyr Gly Ile Glu Gln Pro Ser Ser Gln Phe Ser Ser
10 15 20

gat ctc ttc ggc ttc aac ctc gtt tca gcg ccg gac cag cac cat cgt 152
Asp Leu Phe Gly Phe Asn Leu Val Ser Ala Pro Asp Gln His His Arg
25 30 35

ctt cat ttc acc gac cat gag ata agt tta ttg cca cgt gga ata caa 200
Leu His Phe Thr Asp His Glu Ile Ser Leu Leu Pro Arg Gly Ile Gln
40 45 50

ggg ctt acg gtg gct gga aac aac agt aac act att aca acg atc cag 248
Gly Leu Thr Val Ala Gly Asn Asn Ser Asn Thr Ile Thr Thr Ile Gln
55 60 65

agt ggt ggc tgt gtt ggt ggg ttt agt ggc ttt acg gac ggc gga gga 296
Ser Gly Gly Cys Val Gly Gly Phe Ser Gly Phe Thr Asp Gly Gly Gly
70 75 80 85

aca ggg agg tgg ccg agg caa gag acg ttg atg ttg ttg gag gtc aga 344
Thr Gly Arg Trp Pro Arg Gln Glu Thr Leu Met Leu Leu Glu Val Arg
90 95 100

tct cgt ctt gat cac aag ttc aaa gaa gct aat caa aag ggt cct ctc 392
Ser Arg Leu Asp His Lys Phe Lys Glu Ala Asn Gln Lys Gly Pro Leu
105 110 115

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tgg gat gaa gtt tct agg att atg tcg gag gaa cat gga tac act agg      440
Trp Asp Glu Val Ser Arg Ile Met Ser Glu Glu His Gly Tyr Thr Arg
        120                 125                 130

agt ggc aag aag tgt aga gag aag ttc gag aat ctc tac aag tac tat      488
Ser Gly Lys Lys Cys Arg Glu Lys Phe Glu Asn Leu Tyr Lys Tyr Tyr
    135                 140                 145

aaa aaa aca aaa gaa ggc aaa tcc ggt cgg cga caa gat ggt aaa aac      536
Lys Lys Thr Lys Glu Gly Lys Ser Gly Arg Arg Gln Asp Gly Lys Asn
150                 155                 160                 165

tat aga ttt ttc cgg cag ctt gaa gcg ata tac ggc gaa tcc aaa gac      584
Tyr Arg Phe Phe Arg Gln Leu Glu Ala Ile Tyr Gly Glu Ser Lys Asp
                170                 175                 180

tcg gtt tct tgc tat aac aac acg cag ttc ata atg acc aat gct ctt      632
Ser Val Ser Cys Tyr Asn Asn Thr Gln Phe Ile Met Thr Asn Ala Leu
            185                 190                 195

cat agt aat ttc cgc gct tct aac att cat aac atc gtc cct cat cat      680
His Ser Asn Phe Arg Ala Ser Asn Ile His Asn Ile Val Pro His His
        200                 205                 210

cag aat ccc ttg atg acc aat acc aat act caa agt caa agc ctt agc      728
Gln Asn Pro Leu Met Thr Asn Thr Asn Thr Gln Ser Gln Ser Leu Ser
    215                 220                 225

att tct aac aat ttc aac tcc tcc tcc gat ttg gat cta act tct tcc      776
Ile Ser Asn Asn Phe Asn Ser Ser Ser Asp Leu Asp Leu Thr Ser Ser
230                 235                 240                 245

tct gaa gga aac gaa act act aaa aga gag ggg atg cat tgg aag gaa      824
Ser Glu Gly Asn Glu Thr Thr Lys Arg Glu Gly Met His Trp Lys Glu
                250                 255                 260

aag atc aag gaa ttc att ggt gtt cat atg gag agg ttg ata gag aag      872
Lys Ile Lys Glu Phe Ile Gly Val His Met Glu Arg Leu Ile Glu Lys
            265                 270                 275

caa gat ttt tgg ctt gag aag ttg atg aag att gtg gaa gac aaa gaa      920
Gln Asp Phe Trp Leu Glu Lys Leu Met Lys Ile Val Glu Asp Lys Glu
        280                 285                 290

cat caa agg atg ctg aga gaa gag gaa tgg aga agg att gaa gcg gaa      968
His Gln Arg Met Leu Arg Glu Glu Glu Trp Arg Arg Ile Glu Ala Glu
    295                 300                 305

agg atc gat aag gaa cgt tcg ttt tgg aca aaa gag agg gag agg att     1016
Arg Ile Asp Lys Glu Arg Ser Phe Trp Thr Lys Glu Arg Glu Arg Ile
310                 315                 320                 325

gaa gct cgg gat gtt gcg gtg att aat gcc ttg cag tac ttg acg gga     1064
Glu Ala Arg Asp Val Ala Val Ile Asn Ala Leu Gln Tyr Leu Thr Gly
                330                 335                 340
```

```
agg gca ttg ata agg ccg gat tct tcg tct cct aca gag agg att aat     1112
Arg Ala Leu Ile Arg Pro Asp Ser Ser Ser Pro Thr Glu Arg Ile Asn
            345                 350                 355

ggg aat gga agc gat aaa atg atg gct gat aat gaa ttt gct gat gaa     1160
Gly Asn Gly Ser Asp Lys Met Met Ala Asp Asn Glu Phe Ala Asp Glu
        360                 365                 370

gga aat aag ggc aag atg gat aaa aaa caa atg aat aag aaa agg aag     1208
Gly Asn Lys Gly Lys Met Asp Lys Lys Gln Met Asn Lys Lys Arg Lys
    375                 380                 385

gag aaa tgg tca agc cac gga ggg aat cat cca aga acc aaa gag aat     1256
Glu Lys Trp Ser Ser His Gly Gly Asn His Pro Arg Thr Lys Glu Asn
390                 395                 400                 405

atg atg ata tac aac aat caa gaa act aag att aat gat ttt tgt cga     1304
Met Met Ile Tyr Asn Asn Gln Glu Thr Lys Ile Asn Asp Phe Cys Arg
                410                 415                 420

gat gat gac caa tgc cat cat gaa ggt tac tca cct tca aac tcc aag     1352
Asp Asp Asp Gln Cys His His Glu Gly Tyr Ser Pro Ser Asn Ser Lys
            425                 430                 435

aac gca gga act ccg agc tgc agc aat gcc atg gca gct agt aca aag     1400
Asn Ala Gly Thr Pro Ser Cys Ser Asn Ala Met Ala Ala Ser Thr Lys
        440                 445                 450

tgc ttt cca ttg ctt gaa gga gaa gga gat cag aac ttg tgg gag ggt     1448
Cys Phe Pro Leu Leu Glu Gly Glu Gly Asp Gln Asn Leu Trp Glu Gly
    455                 460                 465

tat ggt ttg aag caa agg aaa gaa aat aat cat cag taa gctacatttt      1497
Tyr Gly Leu Lys Gln Arg Lys Glu Asn Asn His Gln
470                 475                 480

tcattctcaa aatgaagaat aagagaactt agaaacgat                         1536
```

<210> 466 <211> 481 <212> PRT <213> Arabidopsis thaliana <400> 466

```
Met Glu Asp His Gln Asn His Pro Gln Tyr Gly Ile Glu Gln Pro Ser
1               5                   10                  15

Ser Gln Phe Ser Ser Asp Leu Phe Gly Phe Asn Leu Val Ser Ala Pro
            20                  25                  30

Asp Gln His His Arg Leu His Phe Thr Asp His Glu Ile Ser Leu Leu
        35                  40                  45

Pro Arg Gly Ile Gln Gly Leu Thr Val Ala Gly Asn Asn Ser Asn Thr
    50                  55                  60
```

Ile Thr Thr Ile Gln Ser Gly Gly Cys Val Gly Gly Phe Ser Gly Phe
65 70 75 80

Thr Asp Gly Gly Gly Thr Gly Arg Trp Pro Arg Gln Glu Thr Leu Met
85 90 95

Leu Leu Glu Val Arg Ser Arg Leu Asp His Lys Phe Lys Glu Ala Asn
100 105 110

Gln Lys Gly Pro Leu Trp Asp Glu Val Ser Arg Ile Met Ser Glu Glu
115 120 125

His Gly Tyr Thr Arg Ser Gly Lys Lys Cys Arg Glu Lys Phe Glu Asn
130 135 140

Leu Tyr Lys Tyr Tyr Lys Lys Thr Lys Glu Gly Lys Ser Gly Arg Arg
145 150 155 160

Gln Asp Gly Lys Asn Tyr Arg Phe Phe Arg Gln Leu Glu Ala Ile Tyr
165 170 175

Gly Glu Ser Lys Asp Ser Val Ser Cys Tyr Asn Asn Thr Gln Phe Ile
180 185 190

Met Thr Asn Ala Leu His Ser Asn Phe Arg Ala Ser Asn Ile His Asn
195 200 205

Ile Val Pro His His Gln Asn Pro Leu Met Thr Asn Thr Asn Thr Gln
210 215 220

Ser Gln Ser Leu Ser Ile Ser Asn Asn Phe Asn Ser Ser Ser Asp Leu
225 230 235 240

Asp Leu Thr Ser Ser Ser Glu Gly Asn Glu Thr Thr Lys Arg Glu Gly
245 250 255

Met His Trp Lys Glu Lys Ile Lys Glu Phe Ile Gly Val His Met Glu
260 265 270

Arg Leu Ile Glu Lys Gln Asp Phe Trp Leu Glu Lys Leu Met Lys Ile
275 280 285

Val Glu Asp Lys Glu His Gln Arg Met Leu Arg Glu Glu Glu Trp Arg

290 295 300

Arg Ile Glu Ala Glu Arg Ile Asp Lys Glu Arg Ser Phe Trp Thr Lys
305 310 315 320

Glu Arg Glu Arg Ile Glu Ala Arg Asp Val Ala Val Ile Asn Ala Leu
325 330 335

Gln Tyr Leu Thr Gly Arg Ala Leu Ile Arg Pro Asp Ser Ser Ser Pro
340 345 350

Thr Glu Arg Ile Asn Gly Asn Gly Ser Asp Lys Met Met Ala Asp Asn
355 360 365

Glu Phe Ala Asp Glu Gly Asn Lys Gly Lys Met Asp Lys Lys Gln Met
370 375 380

Asn Lys Lys Arg Lys Glu Lys Trp Ser Ser His Gly Gly Asn His Pro
385 390 395 400

Arg Thr Lys Glu Asn Met Met Ile Tyr Asn Asn Gln Glu Thr Lys Ile
405 410 415

Asn Asp Phe Cys Arg Asp Asp Asp Gln Cys His His Glu Gly Tyr Ser
420 425 430

Pro Ser Asn Ser Lys Asn Ala Gly Thr Pro Ser Cys Ser Asn Ala Met
435 440 445

Ala Ala Ser Thr Lys Cys Phe Pro Leu Leu Glu Gly Glu Gly Asp Gln
450 455 460

Asn Leu Trp Glu Gly Tyr Gly Leu Lys Gln Arg Lys Glu Asn Asn His
465 470 475 480

Gln

<210> 467 <211> 1215 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1215) <223> G2109

<400> 467
atg gga agg gtt aag ttg aag att aaa aga ctt gag agc aca agc aac 48
Met Gly Arg Val Lys Leu Lys Ile Lys Arg Leu Glu Ser Thr Ser Asn

```
1               5                  10                  15

agg caa gtt aca tac acg aag aga aaa aat ggg att ttg aag aaa gcc      96
Arg Gln Val Thr Tyr Thr Lys Arg Lys Asn Gly Ile Leu Lys Lys Ala
            20                  25                  30

aaa gag tta tcg att ttg tgt gat att gat att gtc ctt ctt atg ttt     144
Lys Glu Leu Ser Ile Leu Cys Asp Ile Asp Ile Val Leu Leu Met Phe
        35                  40                  45

tcc cct acc gga aga gct act gct ttc cat gga gaa cac agg tat aat     192
Ser Pro Thr Gly Arg Ala Thr Ala Phe His Gly Glu His Arg Tyr Asn
    50                  55                  60

tat caa aat cat tct tat gca ttg aag aaa act ttt aag aaa ctg gat     240
Tyr Gln Asn His Ser Tyr Ala Leu Lys Lys Thr Phe Lys Lys Leu Asp
65                  70                  75                  80

cat gat gta aat ata cat gac ttt tta gga gca agg aat caa act att     288
His Asp Val Asn Ile His Asp Phe Leu Gly Ala Arg Asn Gln Thr Ile
                85                  90                  95

gag gta tgg atc gac cat ctt cgg ttc atg aat ttt ctt gga tac ttt     336
Glu Val Trp Ile Asp His Leu Arg Phe Met Asn Phe Leu Gly Tyr Phe
            100                 105                 110

tta atc tct ttg agt caa att gct aaa gtc tgt gtt aac att acc aca     384
Leu Ile Ser Leu Ser Gln Ile Ala Lys Val Cys Val Asn Ile Thr Thr
        115                 120                 125

cga cag ggt cta agt aac caa gta gcc att tac caa gct cag cta atg     432
Arg Gln Gly Leu Ser Asn Gln Val Ala Ile Tyr Gln Ala Gln Leu Met
    130                 135                 140

gag tgt cat agg agg ttg agt tgt tgg acg aac atc gat aga ata gaa     480
Glu Cys His Arg Arg Leu Ser Cys Trp Thr Asn Ile Asp Arg Ile Glu
145                 150                 155                 160

aac act gag cac ctc gat tta ttg gaa gaa tca ttg agg aaa tcc att     528
Asn Thr Glu His Leu Asp Leu Leu Glu Glu Ser Leu Arg Lys Ser Ile
                165                 170                 175

gaa aga atc cag att cac aag gaa cat tac aga aag aac caa ctc ttg     576
Glu Arg Ile Gln Ile His Lys Glu His Tyr Arg Lys Asn Gln Leu Leu
            180                 185                 190

cca ata gaa tgt gca aca aca cag ttt cac agc ggg ata cag ttg cct     624
Pro Ile Glu Cys Ala Thr Thr Gln Phe His Ser Gly Ile Gln Leu Pro
        195                 200                 205

atg gcg atg gga ggt aat agt agt atg caa gaa gct cac tcc atg tct     672
Met Ala Met Gly Gly Asn Ser Ser Met Gln Glu Ala His Ser Met Ser
    210                 215                 220

tgg ctt cct gat aat gat cac cag caa aca atc tta cct ggt gat tcc     720
Trp Leu Pro Asp Asn Asp His Gln Gln Thr Ile Leu Pro Gly Asp Ser
225                 230                 235                 240
```

```
agt ttt ctt ccc cat aga gag atg gat ggt tcg att ccc gtt tac tca      768
Ser Phe Leu Pro His Arg Glu Met Asp Gly Ser Ile Pro Val Tyr Ser
                245                 250                 255

agc tgc ttc ttt gag tct acg aaa cca gaa gat cag ata tgc agc aac      816
Ser Cys Phe Phe Glu Ser Thr Lys Pro Glu Asp Gln Ile Cys Ser Asn
            260                 265                 270

ccg gga caa cag ttt gag cag tta gaa caa caa gga aac ggt tgt ttg      864
Pro Gly Gln Gln Phe Glu Gln Leu Glu Gln Gln Gly Asn Gly Cys Leu
        275                 280                 285

ggg tta caa caa ctt gga gag gaa tat tca tat cct aca ccg ttt ggt      912
Gly Leu Gln Gln Leu Gly Glu Glu Tyr Ser Tyr Pro Thr Pro Phe Gly
    290                 295                 300

act act ttg gga atg gaa gaa gat caa gag aaa aag ata aaa tct gaa      960
Thr Thr Leu Gly Met Glu Glu Asp Gln Glu Lys Lys Ile Lys Ser Glu
305                 310                 315                 320

atg gaa ttg aac aac ttg caa caa cag caa cag caa caa caa caa caa     1008
Met Glu Leu Asn Asn Leu Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
                325                 330                 335

caa caa caa gat cct tca atg tat gat ccc atg gct aat aat aat ggt     1056
Gln Gln Gln Asp Pro Ser Met Tyr Asp Pro Met Ala Asn Asn Asn Gly
            340                 345                 350

ggc tgc ttt cag att cct cat gat cag tcc atg ttt gtc aat gat cat     1104
Gly Cys Phe Gln Ile Pro His Asp Gln Ser Met Phe Val Asn Asp His
        355                 360                 365

cat cat cat cat cac cac cat cat caa aat tgg gtt cca gat tca atg     1152
His His His His His His His His Gln Asn Trp Val Pro Asp Ser Met
    370                 375                 380

ttt ggt cag act tct tac aac cag gtt tgt gtg ttc aca cct cca ttg     1200
Phe Gly Gln Thr Ser Tyr Asn Gln Val Cys Val Phe Thr Pro Pro Leu
385                 390                 395                 400

gaa cta tct agg tag                                                1215
Glu Leu Ser Arg
```

<210> 468 <211> 404 <212> PRT <213> Arabidopsis thaliana <400> 468

```
Met Gly Arg Val Lys Leu Lys Ile Lys Arg Leu Glu Ser Thr Ser Asn
1               5                   10                  15

Arg Gln Val Thr Tyr Thr Lys Arg Lys Asn Gly Ile Leu Lys Lys Ala
            20                  25                  30

Lys Glu Leu Ser Ile Leu Cys Asp Ile Asp Ile Val Leu Leu Met Phe
```

35 40 45

Ser Pro Thr Gly Arg Ala Thr Ala Phe His Gly Glu His Arg Tyr Asn
50 55 60

Tyr Gln Asn His Ser Tyr Ala Leu Lys Lys Thr Phe Lys Lys Leu Asp
65 70 75 80

His Asp Val Asn Ile His Asp Phe Leu Gly Ala Arg Asn Gln Thr Ile
85 90 95

Glu Val Trp Ile Asp His Leu Arg Phe Met Asn Phe Leu Gly Tyr Phe
100 105 110

Leu Ile Ser Leu Ser Gln Ile Ala Lys Val Cys Val Asn Ile Thr Thr
115 120 125

Arg Gln Gly Leu Ser Asn Gln Val Ala Ile Tyr Gln Ala Gln Leu Met
130 135 140

Glu Cys His Arg Arg Leu Ser Cys Trp Thr Asn Ile Asp Arg Ile Glu
145 150 155 160

Asn Thr Glu His Leu Asp Leu Leu Glu Glu Ser Leu Arg Lys Ser Ile
165 170 175

Glu Arg Ile Gln Ile His Lys Glu His Tyr Arg Lys Asn Gln Leu Leu
180 185 190

Pro Ile Glu Cys Ala Thr Thr Gln Phe His Ser Gly Ile Gln Leu Pro
195 200 205

Met Ala Met Gly Gly Asn Ser Ser Met Gln Glu Ala His Ser Met Ser
210 215 220

Trp Leu Pro Asp Asn Asp His Gln Gln Thr Ile Leu Pro Gly Asp Ser
225 230 235 240

Ser Phe Leu Pro His Arg Glu Met Asp Gly Ser Ile Pro Val Tyr Ser
245 250 255

Ser Cys Phe Phe Glu Ser Thr Lys Pro Glu Asp Gln Ile Cys Ser Asn
260 265 270

Pro Gly Gln Gln Phe Glu Gln Leu Glu Gln Gln Gly Asn Gly Cys Leu
275 280 285

Gly Leu Gln Gln Leu Gly Glu Glu Tyr Ser Tyr Pro Thr Pro Phe Gly
290 295 300

Thr Thr Leu Gly Met Glu Glu Asp Gln Glu Lys Lys Ile Lys Ser Glu
305 310 315 320

Met Glu Leu Asn Asn Leu Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
325 330 335

Gln Gln Gln Asp Pro Ser Met Tyr Asp Pro Met Ala Asn Asn Asn Gly
340 345 350

Gly Cys Phe Gln Ile Pro His Asp Gln Ser Met Phe Val Asn Asp His
355 360 365

His His His His His His His His Gln Asn Trp Val Pro Asp Ser Met
370 375 380

Phe Gly Gln Thr Ser Tyr Asn Gln Val Cys Val Phe Thr Pro Pro Leu
385 390 395 400

Glu Leu Ser Arg

<210> 469 <211> 1019 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (41)..(988) <223> G2130

<400> 469
cctctcttca ttttttaact ccctctctct ctctctctct atg gag aga cga acg 55
Met Glu Arg Arg Thr
1 5

aga cga gtg aag ttc aca gag aat cgt acg gtc aca aac gta gca gct 103
Arg Arg Val Lys Phe Thr Glu Asn Arg Thr Val Thr Asn Val Ala Ala
10 15 20

aca cca tct aac ggg tct ccg aga ctg gtc cgt atc act gtt act gat 151
Thr Pro Ser Asn Gly Ser Pro Arg Leu Val Arg Ile Thr Val Thr Asp
25 30 35

cct ttc gct act gac tcg tct agc gac gac gac gac aac aac aac gtc 199
Pro Phe Ala Thr Asp Ser Ser Ser Asp Asp Asp Asp Asn Asn Asn Val
40 45 50

```
acg gtg gtt cca aga gtg aaa cga tac gtg aag gag att aga ttc tgc      247
Thr Val Val Pro Arg Val Lys Arg Tyr Val Lys Glu Ile Arg Phe Cys
    55                  60                  65

caa ggt gaa tct tct tcc tcc acc gcg gcg agg aaa ggt aag cac aag      295
Gln Gly Glu Ser Ser Ser Ser Thr Ala Ala Arg Lys Gly Lys His Lys
70                  75                  80                  85

gag gag gaa agc gta gtg gtt gaa gat gac gtg tcg acg tcg gtg aag      343
Glu Glu Glu Ser Val Val Val Glu Asp Asp Val Ser Thr Ser Val Lys
                90                  95                  100

cct aaa aag tac aga ggc gtg aga cag aga cct tgg gga aaa ttc gcg      391
Pro Lys Lys Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Phe Ala
            105                 110                 115

gcg gag att aga gat ccg tcg agc cgt act cgg att tgg ctt ggg act      439
Ala Glu Ile Arg Asp Pro Ser Ser Arg Thr Arg Ile Trp Leu Gly Thr
        120                 125                 130

ttt gtc acg gcg gag gaa gct gct ata gcg tac gat aga gcc gcg att      487
Phe Val Thr Ala Glu Glu Ala Ala Ile Ala Tyr Asp Arg Ala Ala Ile
    135                 140                 145

cat ctc aaa gga cct aaa gcg ctc acg aat ttc cta act ccg ccg acg      535
His Leu Lys Gly Pro Lys Ala Leu Thr Asn Phe Leu Thr Pro Pro Thr
150                 155                 160                 165

cca acg ccg gtt atc gat ctc caa acg gtt tcc gcc tgc gat tac ggt      583
Pro Thr Pro Val Ile Asp Leu Gln Thr Val Ser Ala Cys Asp Tyr Gly
                170                 175                 180

aga gat tct cgg cag agc ctt cat tca ccg acc tct gtt cta aga ttc      631
Arg Asp Ser Arg Gln Ser Leu His Ser Pro Thr Ser Val Leu Arg Phe
            185                 190                 195

aac gtc aac gag gaa aca gag cat gag att gaa gcg atc gag cta tct      679
Asn Val Asn Glu Glu Thr Glu His Glu Ile Glu Ala Ile Glu Leu Ser
        200                 205                 210

ccg gag aga aag tcg acg gtt ata aaa gaa gaa gaa gaa tcg tcg gcg      727
Pro Glu Arg Lys Ser Thr Val Ile Lys Glu Glu Glu Glu Ser Ser Ala
    215                 220                 225

ggt ttg gtg ttc ccg gat ccg tat ctg tta ccg gat tta tct ctc gcc      775
Gly Leu Val Phe Pro Asp Pro Tyr Leu Leu Pro Asp Leu Ser Leu Ala
230                 235                 240                 245

ggc gaa tgt ttt tgg gat acc gaa att gcc cct gac ctt ttg ttt ctc      823
Gly Glu Cys Phe Trp Asp Thr Glu Ile Ala Pro Asp Leu Leu Phe Leu
                250                 255                 260

gat gaa gaa acc aaa atc caa tca acg ttg tta cca aac aca gag gtt      871
Asp Glu Glu Thr Lys Ile Gln Ser Thr Leu Leu Pro Asn Thr Glu Val
            265                 270                 275
```

tcg aaa caa gga gaa aac gaa act gaa gat ttc gag ttt ggt ttg att 919
Ser Lys Gln Gly Glu Asn Glu Thr Glu Asp Phe Glu Phe Gly Leu Ile
280 285 290

gat gat ttc gag tct tct cca tgg gat gtg gat cat ttc ttc gac cat 967
Asp Asp Phe Glu Ser Ser Pro Trp Asp Val Asp His Phe Phe Asp His
295 300 305

cat cat cac tct ttc gat taa aaatctcttc ttttttgggg aaatttttgt g 1019
His His His Ser Phe Asp
310 315

<210> 470 <211> 315 <212> PRT <213> Arabidopsis thaliana <400> 470

Met Glu Arg Arg Thr Arg Arg Val Lys Phe Thr Glu Asn Arg Thr Val
1 5 10 15

Thr Asn Val Ala Ala Thr Pro Ser Asn Gly Ser Pro Arg Leu Val Arg
20 25 30

Ile Thr Val Thr Asp Pro Phe Ala Thr Asp Ser Ser Ser Asp Asp Asp
35 40 45

Asp Asn Asn Asn Val Thr Val Val Pro Arg Val Lys Arg Tyr Val Lys
50 55 60

Glu Ile Arg Phe Cys Gln Gly Glu Ser Ser Ser Ser Thr Ala Ala Arg
65 70 75 80

Lys Gly Lys His Lys Glu Glu Glu Ser Val Val Val Glu Asp Asp Val
85 90 95

Ser Thr Ser Val Lys Pro Lys Lys Tyr Arg Gly Val Arg Gln Arg Pro
100 105 110

Trp Gly Lys Phe Ala Ala Glu Ile Arg Asp Pro Ser Ser Arg Thr Arg
115 120 125

Ile Trp Leu Gly Thr Phe Val Thr Ala Glu Glu Ala Ala Ile Ala Tyr
130 135 140

Asp Arg Ala Ala Ile His Leu Lys Gly Pro Lys Ala Leu Thr Asn Phe
145 150 155 160

Leu Thr Pro Pro Thr Pro Thr Pro Val Ile Asp Leu Gln Thr Val Ser
165 170 175

Substitute Sheet (Rule 26)

```
Ala Cys Asp Tyr Gly Arg Asp Ser Arg Gln Ser Leu His Ser Pro Thr
            180                 185                 190

Ser Val Leu Arg Phe Asn Val Asn Glu Glu Thr Glu His Glu Ile Glu
        195                 200                 205

Ala Ile Glu Leu Ser Pro Glu Arg Lys Ser Thr Val Ile Lys Glu Glu
    210                 215                 220

Glu Glu Ser Ser Ala Gly Leu Val Phe Pro Asp Pro Tyr Leu Leu Pro
225                 230                 235                 240

Asp Leu Ser Leu Ala Gly Glu Cys Phe Trp Asp Thr Glu Ile Ala Pro
                245                 250                 255

Asp Leu Leu Phe Leu Asp Glu Glu Thr Lys Ile Gln Ser Thr Leu Leu
            260                 265                 270

Pro Asn Thr Glu Val Ser Lys Gln Gly Glu Asn Glu Thr Glu Asp Phe
        275                 280                 285

Glu Phe Gly Leu Ile Asp Asp Phe Glu Ser Ser Pro Trp Asp Val Asp
    290                 295                 300

His Phe Phe Asp His His His His Ser Phe Asp
305                 310                 315
```

<210> 471 <211> 1803 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (151)..(1569) <223> G2159

<400> 471

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gaagcagaga agaggaaaaa agctgtgact ttcatacatt actctccctc tccatctctc     60

tcgttgtcac atatcagtat atcacaaaac aaattgcagc cattcacatc tttctcttcc    120

atctctcaac attctctttc tctctgtaaa atg gag aaa cca gtg ttt gca cca      174
                                Met Glu Lys Pro Val Phe Ala Pro
                                1               5

tgg cgt tcc gac caa gtt ttc cgg cca ccg gag aca cca tta gag ccg       222
Trp Arg Ser Asp Gln Val Phe Arg Pro Pro Glu Thr Pro Leu Glu Pro
    10                  15                  20

atg gag ttt ctc tct cgc tcc tgg agc gta tca gct cac gaa gtc tcc       270
Met Glu Phe Leu Ser Arg Ser Trp Ser Val Ser Ala His Glu Val Ser
25                  30                  35                  40
```

```
aaa gct ctc act cct tct cag caa ctc ctc tca aaa gcc tca atc gaa      318
Lys Ala Leu Thr Pro Ser Gln Gln Leu Leu Ser Lys Ala Ser Ile Glu
                45                  50                  55

aac acc acc gtc att ctc gaa gaa ccc atc gcc gcc ggc gag acc gaa      366
Asn Thr Thr Val Ile Leu Glu Glu Pro Ile Ala Ala Gly Glu Thr Glu
            60                  65                  70

acg gag gac aac agc ttc gtc tcc gga aac cct ttc tcc ttc gct tgc      414
Thr Glu Asp Asn Ser Phe Val Ser Gly Asn Pro Phe Ser Phe Ala Cys
        75                  80                  85

tca gaa act tct cag atg gtc atg gat cgt atc tta tct cag tct cag      462
Ser Glu Thr Ser Gln Met Val Met Asp Arg Ile Leu Ser Gln Ser Gln
    90                  95                  100

gaa gtg tcg cca cga aca tct ggt cgg ctt tct cat agc agc ggt cct      510
Glu Val Ser Pro Arg Thr Ser Gly Arg Leu Ser His Ser Ser Gly Pro
105                 110                 115                 120

ctc aat ggt tct tta acc gac agt cct ccg att tcg ccg cat caa gtc      558
Leu Asn Gly Ser Leu Thr Asp Ser Pro Pro Ile Ser Pro His Gln Val
                125                 130                 135

gac gac att aag caa ttt tgc cga tca aac aac aat ttc aac tct caa      606
Asp Asp Ile Lys Gln Phe Cys Arg Ser Asn Asn Asn Phe Asn Ser Gln
            140                 145                 150

tac cgt tca acg gga aca act ccg gga cct atc act gca aca act aca      654
Tyr Arg Ser Thr Gly Thr Thr Pro Gly Pro Ile Thr Ala Thr Thr Thr
        155                 160                 165

cag tcc aag aca gtt gga cgg tgg ttg aaa gac agg agg gag aaa aag      702
Gln Ser Lys Thr Val Gly Arg Trp Leu Lys Asp Arg Arg Glu Lys Lys
    170                 175                 180

aag gaa gag atg aga gca cac aat gct cag ata cat gct gct gta tca      750
Lys Glu Glu Met Arg Ala His Asn Ala Gln Ile His Ala Ala Val Ser
185                 190                 195                 200

gta gct ggt gtg gca gcc gcg gtg gct gct atc gcg gct gca act gct      798
Val Ala Gly Val Ala Ala Ala Val Ala Ala Ile Ala Ala Ala Thr Ala
                205                 210                 215

gct tcg tcg agt gct gga aaa gat gag aat atg gct aag acg gat atg      846
Ala Ser Ser Ser Ala Gly Lys Asp Glu Asn Met Ala Lys Thr Asp Met
            220                 225                 230

gct gtg gct tct gct gca aca ctt gtg gct gct caa tgt gtg gaa gct      894
Ala Val Ala Ser Ala Ala Thr Leu Val Ala Ala Gln Cys Val Glu Ala
        235                 240                 245

gct gaa gtt atg gga gct gag agg gat cat tta gct tcc gtt gtt agt      942
Ala Glu Val Met Gly Ala Glu Arg Asp His Leu Ala Ser Val Val Ser
    250                 255                 260
```

```
tct gct gtt aat gtt cga tct gcg gga gat atc atg aca tta acc gct      990
Ser Ala Val Asn Val Arg Ser Ala Gly Asp Ile Met Thr Leu Thr Ala
265                 270                 275                 280

gga gca gcc aca gcg tta aga gga gtg gct aca ttg aag gct aga gct     1038
Gly Ala Ala Thr Ala Leu Arg Gly Val Ala Thr Leu Lys Ala Arg Ala
                285                 290                 295

atg aag gag gtg tgg cac att gca tca gtt att cca atg gat aaa gga     1086
Met Lys Glu Val Trp His Ile Ala Ser Val Ile Pro Met Asp Lys Gly
            300                 305                 310

atc aat ctc gga ggt tgc agc aat gtt aat ggt aac ggg agc tat gtc     1134
Ile Asn Leu Gly Gly Cys Ser Asn Val Asn Gly Asn Gly Ser Tyr Val
        315                 320                 325

agc tca agc agc agt cat agt ggc gaa ttt cta gtt gag gat aat ttc     1182
Ser Ser Ser Ser Ser His Ser Gly Glu Phe Leu Val Glu Asp Asn Phe
    330                 335                 340

ttg gga cat tgc aat aga gaa tgg ctt gct cga ggt ggc caa ctt ctt     1230
Leu Gly His Cys Asn Arg Glu Trp Leu Ala Arg Gly Gly Gln Leu Leu
345                 350                 355                 360

aaa cgc acc cgc aaa ggt gat ctt cat tgg aaa ata gtt tca gtt tac     1278
Lys Arg Thr Arg Lys Gly Asp Leu His Trp Lys Ile Val Ser Val Tyr
                365                 370                 375

ata aac agg cta aat caa gtt ata ttg aag atg aag agc agg cat gta     1326
Ile Asn Arg Leu Asn Gln Val Ile Leu Lys Met Lys Ser Arg His Val
            380                 385                 390

gga ggg acc ttc acg aag aag aac aaa aat gtt gtg att gat gtg atc     1374
Gly Gly Thr Phe Thr Lys Lys Asn Lys Asn Val Val Ile Asp Val Ile
        395                 400                 405

aaa aac gtt caa gct tgg cca ggc cgc cat ttg ctg gaa gga gga gag     1422
Lys Asn Val Gln Ala Trp Pro Gly Arg His Leu Leu Glu Gly Gly Glu
    410                 415                 420

gat ttg aga tac ttt ggg tta aag acg gtt ccg cga ggg att gta gaa     1470
Asp Leu Arg Tyr Phe Gly Leu Lys Thr Val Pro Arg Gly Ile Val Glu
425                 430                 435                 440

ttt cag tgc aag agc cag aga gag tat gaa atg tgg aca caa ggt gtc     1518
Phe Gln Cys Lys Ser Gln Arg Glu Tyr Glu Met Trp Thr Gln Gly Val
                445                 450                 455

tca agg ctt att gct gtt gct gcc gag agg aat aac aga tat agg ata     1566
Ser Arg Leu Ile Ala Val Ala Ala Glu Arg Asn Asn Arg Tyr Arg Ile
            460                 465                 470

tga agggagtagt agttttaaga gttcagagct acttttgag gggtgatatc           1619

taacttatgg ggccaaatta taacttggag aaagttaagg gtgttttctt tagagtaatg   1679

tctttttgta aggtatatag gattaaatgt ggcctctata agggtagcta gtgaaacaaa   1739
```

tcttggtgtt tgtatatata ttttttttgg ggaaaaagtt taatatcaaa tttttaattt 1799

aaaa 1803

<210> 472 <211> 472 <212> PRT <213> Arabidopsis thaliana <400> 472

Met Glu Lys Pro Val Phe Ala Pro Trp Arg Ser Asp Gln Val Phe Arg
1 5 10 15

Pro Pro Glu Thr Pro Leu Glu Pro Met Glu Phe Leu Ser Arg Ser Trp
20 25 30

Ser Val Ser Ala His Glu Val Ser Lys Ala Leu Thr Pro Ser Gln Gln
35 40 45

Leu Leu Ser Lys Ala Ser Ile Glu Asn Thr Thr Val Ile Leu Glu Glu
50 55 60

Pro Ile Ala Ala Gly Glu Thr Glu Thr Glu Asp Asn Ser Phe Val Ser
65 70 75 80

Gly Asn Pro Phe Ser Phe Ala Cys Ser Glu Thr Ser Gln Met Val Met
85 90 95

Asp Arg Ile Leu Ser Gln Ser Gln Glu Val Ser Pro Arg Thr Ser Gly
100 105 110

Arg Leu Ser His Ser Ser Gly Pro Leu Asn Gly Ser Leu Thr Asp Ser
115 120 125

Pro Pro Ile Ser Pro His Gln Val Asp Asp Ile Lys Gln Phe Cys Arg
130 135 140

Ser Asn Asn Asn Phe Asn Ser Gln Tyr Arg Ser Thr Gly Thr Thr Pro
145 150 155 160

Gly Pro Ile Thr Ala Thr Thr Thr Gln Ser Lys Thr Val Gly Arg Trp
165 170 175

Leu Lys Asp Arg Arg Glu Lys Lys Lys Glu Glu Met Arg Ala His Asn
180 185 190

Ala Gln Ile His Ala Ala Val Ser Val Ala Gly Val Ala Ala Ala Val

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          195                 200                 205

Ala Ala Ile Ala Ala Ala Thr Ala Ala Ser Ser Ser Ala Gly Lys Asp
    210                 215                 220

Glu Asn Met Ala Lys Thr Asp Met Ala Val Ala Ser Ala Ala Thr Leu
225                 230                 235                 240

Val Ala Ala Gln Cys Val Glu Ala Ala Glu Val Met Gly Ala Glu Arg
                245                 250                 255

Asp His Leu Ala Ser Val Val Ser Ser Ala Val Asn Val Arg Ser Ala
            260                 265                 270

Gly Asp Ile Met Thr Leu Thr Ala Gly Ala Ala Thr Ala Leu Arg Gly
        275                 280                 285

Val Ala Thr Leu Lys Ala Arg Ala Met Lys Glu Val Trp His Ile Ala
    290                 295                 300

Ser Val Ile Pro Met Asp Lys Gly Ile Asn Leu Gly Gly Cys Ser Asn
305                 310                 315                 320

Val Asn Gly Asn Gly Ser Tyr Val Ser Ser Ser Ser Ser His Ser Gly
                325                 330                 335

Glu Phe Leu Val Glu Asp Asn Phe Leu Gly His Cys Asn Arg Glu Trp
            340                 345                 350

Leu Ala Arg Gly Gly Gln Leu Leu Lys Arg Thr Arg Lys Gly Asp Leu
        355                 360                 365

His Trp Lys Ile Val Ser Val Tyr Ile Asn Arg Leu Asn Gln Val Ile
    370                 375                 380

Leu Lys Met Lys Ser Arg His Val Gly Gly Thr Phe Thr Lys Lys Asn
385                 390                 395                 400

Lys Asn Val Val Ile Asp Val Ile Lys Asn Val Gln Ala Trp Pro Gly
                405                 410                 415

Arg His Leu Leu Glu Gly Gly Glu Asp Leu Arg Tyr Phe Gly Leu Lys
            420                 425                 430
```

```
Thr Val Pro Arg Gly Ile Val Glu Phe Gln Cys Lys Ser Gln Arg Glu
        435                 440                 445

Tyr Glu Met Trp Thr Gln Gly Val Ser Arg Leu Ile Ala Val Ala Ala
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Glu Arg Asn Asn Arg Tyr Arg Ile
465                 470
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Met Asp Leu Ser Asn Arg Arg Asn Pro Leu Arg Asp Leu Ser Phe Pro
1               5                   10                  15

cct cct ccg ccg cca cct att ttc cac cgt gcg agc tct acg ggg acg       96
Pro Pro Pro Pro Pro Pro Ile Phe His Arg Ala Ser Ser Thr Gly Thr
            20                  25                  30

agt ttt ccg atc tta gcc gtc gcg gtg atc gga atc tta gcc aca gca      144
Ser Phe Pro Ile Leu Ala Val Ala Val Ile Gly Ile Leu Ala Thr Ala
        35                  40                  45

ttt tta ctt gta agc tat tat gtt ttt gtt atc aaa tgt tgt ctc aac      192
Phe Leu Leu Val Ser Tyr Tyr Val Phe Val Ile Lys Cys Cys Leu Asn
    50                  55                  60

tgg cac cga atc gac att ctt ggt cga ttc tcg tta tct cga agg cga      240
Trp His Arg Ile Asp Ile Leu Gly Arg Phe Ser Leu Ser Arg Arg Arg
65                  70                  75                  80

cgc aac gac caa gat cct tta atg gtt tac tct cca gag ctt aga agc      288
Arg Asn Asp Gln Asp Pro Leu Met Val Tyr Ser Pro Glu Leu Arg Ser
                85                  90                  95

cgc ggt ctt gat gaa tcc gtc att aga gca atc cca atc ttt aag ttc      336
Arg Gly Leu Asp Glu Ser Val Ile Arg Ala Ile Pro Ile Phe Lys Phe
            100                 105                 110

aag aag aga tac gac caa aac gac ggc gtt ttt aca gga gaa gga gaa      384
Lys Lys Arg Tyr Asp Gln Asn Asp Gly Val Phe Thr Gly Glu Gly Glu
        115                 120                 125

gaa gaa gaa gag aag aga tct caa gaa tgc tct gtt tgt ttg agt gag      432
Glu Glu Glu Glu Lys Arg Ser Gln Glu Cys Ser Val Cys Leu Ser Glu
    130                 135                 140

ttt caa gat gag gag aag ctg agg att atc cca aat tgt tct cat ttg      480
Phe Gln Asp Glu Glu Lys Leu Arg Ile Ile Pro Asn Cys Ser His Leu
145                 150                 155                 160
```

```
ttt cat atc gac tgt atc gat gtg tgg ctt cag aac aac gcc aat tgt      528
Phe His Ile Asp Cys Ile Asp Val Trp Leu Gln Asn Asn Ala Asn Cys
                165                 170                 175

cct ttg tgt aga act agg gtt tct tgt gac aca agt ttt cct ccg gat      576
Pro Leu Cys Arg Thr Arg Val Ser Cys Asp Thr Ser Phe Pro Pro Asp
            180                 185                 190

cgg gtt tct gcg ccg agc act tct ccc gag aat ctg gtc atg tta aga      624
Arg Val Ser Ala Pro Ser Thr Ser Pro Glu Asn Leu Val Met Leu Arg
        195                 200                 205

ggt gag aac gag tat gtg gtc att gag ctg ggc agt agc atc ggt agt      672
Gly Glu Asn Glu Tyr Val Val Ile Glu Leu Gly Ser Ser Ile Gly Ser
    210                 215                 220

gac aga gat agt cca aga cac gga agg tta ctt acg gga caa gaa agg      720
Asp Arg Asp Ser Pro Arg His Gly Arg Leu Leu Thr Gly Gln Glu Arg
225                 230                 235                 240

tca aat tca ggt tat cta ctg aac gaa aac acc caa aat tcg atc agt      768
Ser Asn Ser Gly Tyr Leu Leu Asn Glu Asn Thr Gln Asn Ser Ile Ser
                245                 250                 255

cca tct ccg aag aag ctt gac cgc gga ggg ctt cca aga aaa ttc cga      816
Pro Ser Pro Lys Lys Leu Asp Arg Gly Gly Leu Pro Arg Lys Phe Arg
            260                 265                 270

aag ctt cac aag atg acg agt atg gga gac gaa tgc atc gac ata aga      864
Lys Leu His Lys Met Thr Ser Met Gly Asp Glu Cys Ile Asp Ile Arg
        275                 280                 285

aga ggt aaa gac gaa cag ttc ggt agt att cag ccc att aga aga tca      912
Arg Gly Lys Asp Glu Gln Phe Gly Ser Ile Gln Pro Ile Arg Arg Ser
    290                 295                 300

atc tca atg gat tca tcg gcg gat aga cag ctt tac ttg gcg gtt caa      960
Ile Ser Met Asp Ser Ser Ala Asp Arg Gln Leu Tyr Leu Ala Val Gln
305                 310                 315                 320

gag gcg att cgg aaa aac cgc gaa gtt ctg gtg gtt gga gac gga gga     1008
Glu Ala Ile Arg Lys Asn Arg Glu Val Leu Val Val Gly Asp Gly Gly
                325                 330                 335

gga tgt agc agt agt agt ggc aat gtt agt aat tcc aaa gtg aag aga     1056
Gly Cys Ser Ser Ser Ser Gly Asn Val Ser Asn Ser Lys Val Lys Arg
            340                 345                 350

tct ttc ttc tct ttt ggg agc agt aga cgt tct aga agt tcc tct aaa     1104
Ser Phe Phe Ser Phe Gly Ser Ser Arg Arg Ser Arg Ser Ser Ser Lys
        355                 360                 365

ttg cca ctt tat ttt gaa ccc taa                                    1128
Leu Pro Leu Tyr Phe Glu Pro
    370                 375
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<210> 474 <211> 375 <212> PRT <213> Arabidopsis thaliana <400> 474

Met Asp Leu Ser Asn Arg Arg Asn Pro Leu Arg Asp Leu Ser Phe Pro
1 5 10 15

Pro Pro Pro Pro Pro Pro Ile Phe His Arg Ala Ser Ser Thr Gly Thr
20 25 30

Ser Phe Pro Ile Leu Ala Val Ala Val Ile Gly Ile Leu Ala Thr Ala
35 40 45

Phe Leu Leu Val Ser Tyr Tyr Val Phe Val Ile Lys Cys Cys Leu Asn
50 55 60

Trp His Arg Ile Asp Ile Leu Gly Arg Phe Ser Leu Ser Arg Arg Arg
65 70 75 80

Arg Asn Asp Gln Asp Pro Leu Met Val Tyr Ser Pro Glu Leu Arg Ser
85 90 95

Arg Gly Leu Asp Glu Ser Val Ile Arg Ala Ile Pro Ile Phe Lys Phe
100 105 110

Lys Lys Arg Tyr Asp Gln Asn Asp Gly Val Phe Thr Gly Glu Gly Glu
115 120 125

Glu Glu Glu Glu Lys Arg Ser Gln Glu Cys Ser Val Cys Leu Ser Glu
130 135 140

Phe Gln Asp Glu Glu Lys Leu Arg Ile Ile Pro Asn Cys Ser His Leu
145 150 155 160

Phe His Ile Asp Cys Ile Asp Val Trp Leu Gln Asn Asn Ala Asn Cys
165 170 175

Pro Leu Cys Arg Thr Arg Val Ser Cys Asp Thr Ser Phe Pro Pro Asp
180 185 190

Arg Val Ser Ala Pro Ser Thr Ser Pro Glu Asn Leu Val Met Leu Arg
195 200 205

Gly Glu Asn Glu Tyr Val Val Ile Glu Leu Gly Ser Ser Ile Gly Ser
210 215 220

```
Asp Arg Asp Ser Pro Arg His Gly Arg Leu Leu Thr Gly Gln Glu Arg
225                 230                 235                 240

Ser Asn Ser Gly Tyr Leu Leu Asn Glu Asn Thr Gln Asn Ser Ile Ser
            245                 250                 255

Pro Ser Pro Lys Lys Leu Asp Arg Gly Gly Leu Pro Arg Lys Phe Arg
            260                 265                 270

Lys Leu His Lys Met Thr Ser Met Gly Asp Glu Cys Ile Asp Ile Arg
        275                 280                 285

Arg Gly Lys Asp Glu Gln Phe Gly Ser Ile Gln Pro Ile Arg Arg Ser
    290                 295                 300

Ile Ser Met Asp Ser Ser Ala Asp Arg Gln Leu Tyr Leu Ala Val Gln
305                 310                 315                 320

Glu Ala Ile Arg Lys Asn Arg Glu Val Leu Val Val Gly Asp Gly Gly
                325                 330                 335

Gly Cys Ser Ser Ser Ser Gly Asn Val Ser Asn Ser Lys Val Lys Arg
            340                 345                 350

Ser Phe Phe Ser Phe Gly Ser Ser Arg Arg Ser Arg Ser Ser Ser Lys
        355                 360                 365

Leu Pro Leu Tyr Phe Glu Pro
    370                 375
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<210> 475 <211> 1398 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1398) <223> G2242

<400> 475

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atg aaa tgg gtt ttc cca gaa atc aaa aca act cag aat ttc ctc tct       48
Met Lys Trp Val Phe Pro Glu Ile Lys Thr Thr Gln Asn Phe Leu Ser
1               5                   10                  15

cct tca tca ctt cca caa gaa cca ccg tta tct ctc cgc tcc agc gca       96
Pro Ser Ser Leu Pro Gln Glu Pro Pro Leu Ser Leu Arg Ser Ser Ala
            20                  25                  30

aac ttc gat cta aac agc aaa atc agt cca agt att ctc ctc ata atc      144
Asn Phe Asp Leu Asn Ser Lys Ile Ser Pro Ser Ile Leu Leu Ile Ile
        35                  40                  45
```

```
ata atc ctc tca atc atc ttc ttc atc tcc ggt ctc ctt cat ctc tta      192
Ile Ile Leu Ser Ile Ile Phe Phe Ile Ser Gly Leu Leu His Leu Leu
    50                  55                  60

gtc aga ttc ctc ctc aca cca tcg agc aga gac aga gaa gat tac ttc      240
Val Arg Phe Leu Leu Thr Pro Ser Ser Arg Asp Arg Glu Asp Tyr Phe
65                  70                  75                  80

gac aac gtc act gct ctt caa ggc cag ctt caa cag ctt ttt cat ctc      288
Asp Asn Val Thr Ala Leu Gln Gly Gln Leu Gln Gln Leu Phe His Leu
                85                  90                  95

cat gat tct gga gtt gac caa tcc ttc atc gac acg tta cct gtt ttc      336
His Asp Ser Gly Val Asp Gln Ser Phe Ile Asp Thr Leu Pro Val Phe
            100                 105                 110

cat tac aaa tcc ata atc ggt ctc aag aac tat cct ttt gat tgt gca      384
His Tyr Lys Ser Ile Ile Gly Leu Lys Asn Tyr Pro Phe Asp Cys Ala
        115                 120                 125

gtt tgt ctt tgt gag ttc gaa aca gag gat aag ctc agg ctc tta cct      432
Val Cys Leu Cys Glu Phe Glu Thr Glu Asp Lys Leu Arg Leu Leu Pro
    130                 135                 140

aaa tgc agc cac gcc ttt cac atg gat tgt atc gat act tgg ctt cta      480
Lys Cys Ser His Ala Phe His Met Asp Cys Ile Asp Thr Trp Leu Leu
145                 150                 155                 160

tct cac tct act tgt cct ttg tgt aga tcc agt ctc ctc tct gat ctc      528
Ser His Ser Thr Cys Pro Leu Cys Arg Ser Ser Leu Leu Ser Asp Leu
                165                 170                 175

tct tcg cac caa gat cct cgt tct tct ttc ctc ctt gtg ctc gag tct      576
Ser Ser His Gln Asp Pro Arg Ser Ser Phe Leu Leu Val Leu Glu Ser
            180                 185                 190

gcg agt gat cat agc tcg aga gag att gga gga gat aga gac agt gca      624
Ala Ser Asp His Ser Ser Arg Glu Ile Gly Gly Asp Arg Asp Ser Ala
        195                 200                 205

gct tgt gtg gct gca aat gat gat att gat gtg tct agt gct cat ctt      672
Ala Cys Val Ala Ala Asn Asp Asp Ile Asp Val Ser Ser Ala His Leu
    210                 215                 220

ggt ttg gtc gga aac aat gat ctt gga tca acc agg ata gat tcg ggt      720
Gly Leu Val Gly Asn Asn Asp Leu Gly Ser Thr Arg Ile Asp Ser Gly
225                 230                 235                 240

cac gga gat cag tac ctg gat ggt gaa ttg ggt ggt tcg gtt gga aag      768
His Gly Asp Gln Tyr Leu Asp Gly Glu Leu Gly Gly Ser Val Gly Lys
                245                 250                 255

gtt gtt cct ttt tca gtt aag cta ggg aag ttt agg aat ata gat att      816
Val Val Pro Phe Ser Val Lys Leu Gly Lys Phe Arg Asn Ile Asp Ile
            260                 265                 270
```

```
ggt gaa gga act agt agc aac aac aac att ggt aat agt agt agt tta      864
Gly Glu Gly Thr Ser Ser Asn Asn Asn Ile Gly Asn Ser Ser Ser Leu
        275                 280                 285

gat gag agg agg tgt ttc tca atg gga tca tat gag tat ata atg gat      912
Asp Glu Arg Arg Cys Phe Ser Met Gly Ser Tyr Glu Tyr Ile Met Asp
    290                 295                 300

gaa gaa acg act ctt aag gtt cat gtt tca acc aag aaa caa tca agc      960
Glu Glu Thr Thr Leu Lys Val His Val Ser Thr Lys Lys Gln Ser Ser
305                 310                 315                 320

aag aac cgt ggc ttg ccc ggt cat agg aca gcg atg tcc gaa tgc ggg     1008
Lys Asn Arg Gly Leu Pro Gly His Arg Thr Ala Met Ser Glu Cys Gly
                325                 330                 335

ttt gat cca aca ggg aga ttg aaa ttc agt ggg agt gga tcg atg agg     1056
Phe Asp Pro Thr Gly Arg Leu Lys Phe Ser Gly Ser Gly Ser Met Arg
            340                 345                 350

ata gtg gaa gaa gcg gcc gag aag aat gta gtg gaa aga gag agc ttt     1104
Ile Val Glu Glu Ala Ala Glu Lys Asn Val Val Glu Arg Glu Ser Phe
        355                 360                 365

tcg gta tcg aaa ata tgg cta agg ggg aag aag gag aag cat agt aaa     1152
Ser Val Ser Lys Ile Trp Leu Arg Gly Lys Lys Glu Lys His Ser Lys
    370                 375                 380

gtt caa gga aaa gag gat agt tca ttg gtt tct tcg tct tcg gga aga     1200
Val Gln Gly Lys Glu Asp Ser Ser Leu Val Ser Ser Ser Ser Gly Arg
385                 390                 395                 400

gca ttc tct ttc agg tta tcg aac cag cgg aac cat ccc gat gcg atg     1248
Ala Phe Ser Phe Arg Leu Ser Asn Gln Arg Asn His Pro Asp Ala Met
                405                 410                 415

atc gaa agt ggt tgc gaa gaa gat aat caa aag tgc gaa aac tcg gag     1296
Ile Glu Ser Gly Cys Glu Glu Asp Asn Gln Lys Cys Glu Asn Ser Glu
            420                 425                 430

tct ttg gag act aaa aca cca tct ttt gct agg agg act atg ctt tgg     1344
Ser Leu Glu Thr Lys Thr Pro Ser Phe Ala Arg Arg Thr Met Leu Trp
        435                 440                 445

ctt gca ggg aga caa aac aag gtt gtt cat tct tct tct tca act aat     1392
Leu Ala Gly Arg Gln Asn Lys Val Val His Ser Ser Ser Ser Thr Asn
    450                 455                 460

gtc tag                                                            1398
Val
465
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Met Lys Trp Val Phe Pro Glu Ile Lys Thr Thr Gln Asn Phe Leu Ser
1               5                   10                  15
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Pro Ser Ser Leu Pro Gln Glu Pro Pro Leu Ser Leu Arg Ser Ser Ala
20 25 30

Asn Phe Asp Leu Asn Ser Lys Ile Ser Pro Ser Ile Leu Leu Ile Ile
35 40 45

Ile Ile Leu Ser Ile Ile Phe Phe Ile Ser Gly Leu Leu His Leu Leu
50 55 60

Val Arg Phe Leu Leu Thr Pro Ser Ser Arg Asp Arg Glu Asp Tyr Phe
65 70 75 80

Asp Asn Val Thr Ala Leu Gln Gly Gln Leu Gln Gln Leu Phe His Leu
85 90 95

His Asp Ser Gly Val Asp Gln Ser Phe Ile Asp Thr Leu Pro Val Phe
100 105 110

His Tyr Lys Ser Ile Ile Gly Leu Lys Asn Tyr Pro Phe Asp Cys Ala
115 120 125

Val Cys Leu Cys Glu Phe Glu Thr Glu Asp Lys Leu Arg Leu Leu Pro
130 135 140

Lys Cys Ser His Ala Phe His Met Asp Cys Ile Asp Thr Trp Leu Leu
145 150 155 160

Ser His Ser Thr Cys Pro Leu Cys Arg Ser Ser Leu Leu Ser Asp Leu
165 170 175

Ser Ser His Gln Asp Pro Arg Ser Ser Phe Leu Leu Val Leu Glu Ser
180 185 190

Ala Ser Asp His Ser Ser Arg Glu Ile Gly Gly Asp Arg Asp Ser Ala
195 200 205

Ala Cys Val Ala Ala Asn Asp Asp Ile Asp Val Ser Ser Ala His Leu
210 215 220

Gly Leu Val Gly Asn Asn Asp Leu Gly Ser Thr Arg Ile Asp Ser Gly
225 230 235 240

Substitute Page

His Gly Asp Gln Tyr Leu Asp Gly Glu Leu Gly Gly Ser Val Gly Lys
245 250 255

Val Val Pro Phe Ser Val Lys Leu Gly Lys Phe Arg Asn Ile Asp Ile
260 265 270

Gly Glu Gly Thr Ser Ser Asn Asn Asn Ile Gly Asn Ser Ser Ser Leu
275 280 285

Asp Glu Arg Arg Cys Phe Ser Met Gly Ser Tyr Glu Tyr Ile Met Asp
290 295 300

Glu Glu Thr Thr Leu Lys Val His Val Ser Thr Lys Lys Gln Ser Ser
305 310 315 320

Lys Asn Arg Gly Leu Pro Gly His Arg Thr Ala Met Ser Glu Cys Gly
325 330 335

Phe Asp Pro Thr Gly Arg Leu Lys Phe Ser Gly Ser Gly Ser Met Arg
340 345 350

Ile Val Glu Glu Ala Ala Glu Lys Asn Val Val Glu Arg Glu Ser Phe
355 360 365

Ser Val Ser Lys Ile Trp Leu Arg Gly Lys Lys Glu Lys His Ser Lys
370 375 380

Val Gln Gly Lys Glu Asp Ser Ser Leu Val Ser Ser Ser Ser Gly Arg
385 390 395 400

Ala Phe Ser Phe Arg Leu Ser Asn Gln Arg Asn His Pro Asp Ala Met
405 410 415

Ile Glu Ser Gly Cys Glu Glu Asp Asn Gln Lys Cys Glu Asn Ser Glu
420 425 430

Ser Leu Glu Thr Lys Thr Pro Ser Phe Ala Arg Arg Thr Met Leu Trp
435 440 445

Leu Ala Gly Arg Gln Asn Lys Val Val His Ser Ser Ser Ser Thr Asn
450 455 460

Val
465

<210> 477 <211> 850 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (81)..(626) <223> G2347

<400> 477

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acttaaagct ttaccagaaa atg gag ggt cag aga aca caa cgc cgg ggt tac    113
                       Met Glu Gly Gln Arg Thr Gln Arg Arg Gly Tyr
                       1               5                   10

ttg aaa gac aag gct aca gtc tcc aac ctt gtt gaa gaa gaa atg gag      161
Leu Lys Asp Lys Ala Thr Val Ser Asn Leu Val Glu Glu Glu Met Glu
            15                  20                  25

aat ggc atg gat gga gaa gag gag gat gga gga gac gaa gac aaa agg      209
Asn Gly Met Asp Gly Glu Glu Glu Asp Gly Gly Asp Glu Asp Lys Arg
        30                  35                  40

aag aag gtg atg gaa aga gtt aga ggt cct agc act gac cgt gtt cca      257
Lys Lys Val Met Glu Arg Val Arg Gly Pro Ser Thr Asp Arg Val Pro
    45                  50                  55

tcg cga ctg tgc cag gtc gat agg tgc act gtt aat ttg act gag gcc      305
Ser Arg Leu Cys Gln Val Asp Arg Cys Thr Val Asn Leu Thr Glu Ala
60                  65                  70                  75

aag cag tat tac cgc aga cac aga gta tgt gaa gta cat gca aag gca      353
Lys Gln Tyr Tyr Arg Arg His Arg Val Cys Glu Val His Ala Lys Ala
                80                  85                  90

tct gct gcg act gtt gca ggg gtc agg caa cgc ttt tgt caa caa tgc      401
Ser Ala Ala Thr Val Ala Gly Val Arg Gln Arg Phe Cys Gln Gln Cys
            95                  100                 105

agc agg ttt cat gag cta cca gag ttt gat gaa gct aaa aga agc tgc      449
Ser Arg Phe His Glu Leu Pro Glu Phe Asp Glu Ala Lys Arg Ser Cys
        110                 115                 120

agg agg cgc tta gct gga cac aat gag agg agg agg aag atc tct ggt      497
Arg Arg Arg Leu Ala Gly His Asn Glu Arg Arg Arg Lys Ile Ser Gly
    125                 130                 135

gac agt ttt gga gaa ggg tca ggc cgg aga ggg ttt agc ggt caa ctg      545
Asp Ser Phe Gly Glu Gly Ser Gly Arg Arg Gly Phe Ser Gly Gln Leu
140                 145                 150                 155

atc cag act caa gaa aga aac agg gta gac agg aaa ctt cct atg acc      593
Ile Gln Thr Gln Glu Arg Asn Arg Val Asp Arg Lys Leu Pro Met Thr
                160                 165                 170

aac tca tca ttc aag cga cca cag atc aga taa accctcccgc tctctctctt    646
Asn Ser Ser Phe Lys Arg Pro Gln Ile Arg
            175                 180
```

ctgtcatcta catatgctct atctacactc ttattagaca aataatggca tctaacaatg 706

tcaagaaaag ttggtcatgg tattaaatcc tacacggata tataactata aacctctagt 766

cccctctatg ctgtcctgta atgaatatct atccggaaat gtattcgcat agtcttgcgt 826

ctaataatgt ttattgattt tgta 850

<210> 478 <211> 181 <212> PRT <213> Arabidopsis thaliana <400> 478

Met Glu Gly Gln Arg Thr Gln Arg Arg Gly Tyr Leu Lys Asp Lys Ala
1 5 10 15

Thr Val Ser Asn Leu Val Glu Glu Glu Met Glu Asn Gly Met Asp Gly
20 25 30

Glu Glu Glu Asp Gly Gly Asp Glu Asp Lys Arg Lys Lys Val Met Glu
35 40 45

Arg Val Arg Gly Pro Ser Thr Asp Arg Val Pro Ser Arg Leu Cys Gln
50 55 60

Val Asp Arg Cys Thr Val Asn Leu Thr Glu Ala Lys Gln Tyr Tyr Arg
65 70 75 80

Arg His Arg Val Cys Glu Val His Ala Lys Ala Ser Ala Ala Thr Val
85 90 95

Ala Gly Val Arg Gln Arg Phe Cys Gln Gln Cys Ser Arg Phe His Glu
100 105 110

Leu Pro Glu Phe Asp Glu Ala Lys Arg Ser Cys Arg Arg Arg Leu Ala
115 120 125

Gly His Asn Glu Arg Arg Arg Lys Ile Ser Gly Asp Ser Phe Gly Glu
130 135 140

Gly Ser Gly Arg Arg Gly Phe Ser Gly Gln Leu Ile Gln Thr Gln Glu
145 150 155 160

Arg Asn Arg Val Asp Arg Lys Leu Pro Met Thr Asn Ser Ser Phe Lys
165 170 175

Arg Pro Gln Ile Arg

180

<210> 479 <211> 762 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(630) <223> G2421

<400> 479

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atg gag ggt tcg tcc aaa ggg ttg agg aaa ggt gca tgg act gct gaa       48
Met Glu Gly Ser Ser Lys Gly Leu Arg Lys Gly Ala Trp Thr Ala Glu
1               5                   10                  15

gaa gat agt ctc ttg agg cag tgt att ggt aag tat gga gaa ggc aaa       96
Glu Asp Ser Leu Leu Arg Gln Cys Ile Gly Lys Tyr Gly Glu Gly Lys
            20                  25                  30

tgg cat caa gtt cct tta aga gct ggg cta aat cgg tgc agg aaa agt      144
Trp His Gln Val Pro Leu Arg Ala Gly Leu Asn Arg Cys Arg Lys Ser
        35                  40                  45

tgt aga cta aga tgg tta aac tat ttg aag cca agt atc aag aga gga      192
Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
    50                  55                  60

aaa ttt agt tct gat gaa gtt gat ctt ctt ctt cgt ctt cat aag ctt      240
Lys Phe Ser Ser Asp Glu Val Asp Leu Leu Leu Arg Leu His Lys Leu
65                  70                  75                  80

cta gga aat agg tgg tcc ttg att gct ggt cga tta cct ggt cgg acc      288
Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
                85                  90                  95

gct aat gat gtc aag aac tac tgg aac acc cat ctg agt aag aag cat      336
Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
            100                 105                 110

gaa ccg tgt tgt aaa act aag ata aaa agg ata aat att ata acc cct      384
Glu Pro Cys Cys Lys Thr Lys Ile Lys Arg Ile Asn Ile Ile Thr Pro
        115                 120                 125

cct aat aca ccg gcc caa aaa gtt tgt gaa aat agt atc aca tgt aac      432
Pro Asn Thr Pro Ala Gln Lys Val Cys Glu Asn Ser Ile Thr Cys Asn
    130                 135                 140

aaa gat gat gag aaa gat gat ttt gtg gat aat ttt atg gtt gga gat      480
Lys Asp Asp Glu Lys Asp Asp Phe Val Asp Asn Phe Met Val Gly Asp
145                 150                 155                 160

aat ata tgg ttg gag cgt ttg cta gac gag ggc caa gag gta gat gtg      528
Asn Ile Trp Leu Glu Arg Leu Leu Asp Glu Gly Gln Glu Val Asp Val
                165                 170                 175

ctg gtt aca gaa gcg gcg gca aca gaa aag gag ggc act ttg gcg ttt      576
Leu Val Thr Glu Ala Ala Ala Thr Glu Lys Glu Gly Thr Leu Ala Phe
            180                 185                 190

gac gtt gag caa ctt tgg aat ttg ttc gat gga gag act gtg atc ttt      624
Asp Val Glu Gln Leu Trp Asn Leu Phe Asp Gly Glu Thr Val Ile Phe
```

195 200 205

gat tag tgtttataaa cgtttgtgtt ctcttgtttg tgaggtttct ctatttaatt 680
Asp

tagtatctat tttctaaatt aactaatatc ttatagtatt ttaggcaaac cttatgtttc 740

cgtttctgtg cggccgctct ag 762

<210> 480 <211> 209 <212> PRT <213> Arabidopsis thaliana <400> 480

Met Glu Gly Ser Ser Lys Gly Leu Arg Lys Gly Ala Trp Thr Ala Glu
1 5 10 15

Glu Asp Ser Leu Leu Arg Gln Cys Ile Gly Lys Tyr Gly Glu Gly Lys
20 25 30

Trp His Gln Val Pro Leu Arg Ala Gly Leu Asn Arg Cys Arg Lys Ser
35 40 45

Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
50 55 60

Lys Phe Ser Ser Asp Glu Val Asp Leu Leu Leu Arg Leu His Lys Leu
65 70 75 80

Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
85 90 95

Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
100 105 110

Glu Pro Cys Cys Lys Thr Lys Ile Lys Arg Ile Asn Ile Ile Thr Pro
115 120 125

Pro Asn Thr Pro Ala Gln Lys Val Cys Glu Asn Ser Ile Thr Cys Asn
130 135 140

Lys Asp Asp Glu Lys Asp Asp Phe Val Asp Asn Phe Met Val Gly Asp
145 150 155 160

Asn Ile Trp Leu Glu Arg Leu Leu Asp Glu Gly Gln Glu Val Asp Val
165 170 175

Leu Val Thr Glu Ala Ala Ala Thr Glu Lys Glu Gly Thr Leu Ala Phe
180 185 190

Asp Val Glu Gln Leu Trp Asn Leu Phe Asp Gly Glu Thr Val Ile Phe
195 200 205

Asp

<210> 481 <211> 741 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(741) <223> G2422

<400> 481

```
atg ggc gaa tca ccc aaa ggg ttg aga aaa ggt aca tgg act act gaa       48
Met Gly Glu Ser Pro Lys Gly Leu Arg Lys Gly Thr Trp Thr Thr Glu
1               5                   10                  15

gaa gat att ctc ttg agg caa tgc att gat aag tat gga gaa ggc aaa       96
Glu Asp Ile Leu Leu Arg Gln Cys Ile Asp Lys Tyr Gly Glu Gly Lys
            20                  25                  30

tgg cat cga gtt cct tta aga act ggt ctc aat cgg tgc cga aag agt      144
Trp His Arg Val Pro Leu Arg Thr Gly Leu Asn Arg Cys Arg Lys Ser
        35                  40                  45

tgt aga ctt aga tgg ttg aat tat ttg aag cca agt att aag aga gga      192
Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
    50                  55                  60

aaa ctc tgc tcc gat gaa gtt gat ctt gtt ctt cgc ctt cat aaa ctt      240
Lys Leu Cys Ser Asp Glu Val Asp Leu Val Leu Arg Leu His Lys Leu
65                  70                  75                  80

cta gga aat agg tgg tcc ttg atc gct ggt aga ttg cct ggt cgg act      288
Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
                85                  90                  95

gct aat gat gtc aag aat tac tgg aac act cat ttg agt aag aag cac      336
Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
            100                 105                 110

gat gaa cga tgc tgt aag acg aag atg ata aac aaa aac att act tct      384
Asp Glu Arg Cys Cys Lys Thr Lys Met Ile Asn Lys Asn Ile Thr Ser
        115                 120                 125

cat cct act tca tcg gcc caa aaa atc gat gtt tta aag cct cgg cct      432
His Pro Thr Ser Ser Ala Gln Lys Ile Asp Val Leu Lys Pro Arg Pro
    130                 135                 140

cga tcc ttc tcc gat aaa aat agt tgc aac gat gtc aat atc ttg cca      480
Arg Ser Phe Ser Asp Lys Asn Ser Cys Asn Asp Val Asn Ile Leu Pro
145                 150                 155                 160

aaa gtt gac gtt gtt cct tta cat ctt gga ctc aac aac aat tat gtt      528
```

```
Lys Val Asp Val Val Pro Leu His Leu Gly Leu Asn Asn Asn Tyr Val
                165                 170                 175

tgt gaa agt agt att aca tgt aac aaa gat gag caa aaa gat aag ctt      576
Cys Glu Ser Ser Ile Thr Cys Asn Lys Asp Glu Gln Lys Asp Lys Leu
            180                 185                 190

att aat att aat cta ttg gat gga gat aat atg tgg tgg gaa agt tta      624
Ile Asn Ile Asn Leu Leu Asp Gly Asp Asn Met Trp Trp Glu Ser Leu
        195                 200                 205

ctg gag gca gat gtg ttg ggt cca gaa gct acg gaa aca gca aag ggt      672
Leu Glu Ala Asp Val Leu Gly Pro Glu Ala Thr Glu Thr Ala Lys Gly
    210                 215                 220

gtg acc tta ccg ctt gac ttt gag caa att tgg gct cgg ttt gat gaa      720
Val Thr Leu Pro Leu Asp Phe Glu Gln Ile Trp Ala Arg Phe Asp Glu
225                 230                 235                 240

gag act tta gaa ctg aat tag                                         741
Glu Thr Leu Glu Leu Asn
                245
```

<210> 482 <211> 246 <212> PRT <213> Arabidopsis thaliana <400> 482

```
Met Gly Glu Ser Pro Lys Gly Leu Arg Lys Gly Thr Trp Thr Thr Glu
1               5                   10                  15

Glu Asp Ile Leu Leu Arg Gln Cys Ile Asp Lys Tyr Gly Glu Gly Lys
            20                  25                  30

Trp His Arg Val Pro Leu Arg Thr Gly Leu Asn Arg Cys Arg Lys Ser
        35                  40                  45

Cys Arg Leu Arg Trp Leu Asn Tyr Leu Lys Pro Ser Ile Lys Arg Gly
    50                  55                  60

Lys Leu Cys Ser Asp Glu Val Asp Leu Val Leu Arg Leu His Lys Leu
65                  70                  75                  80

Leu Gly Asn Arg Trp Ser Leu Ile Ala Gly Arg Leu Pro Gly Arg Thr
                85                  90                  95

Ala Asn Asp Val Lys Asn Tyr Trp Asn Thr His Leu Ser Lys Lys His
            100                 105                 110

Asp Glu Arg Cys Cys Lys Thr Lys Met Ile Asn Lys Asn Ile Thr Ser
        115                 120                 125
```

```
His Pro Thr Ser Ser Ala Gln Lys Ile Asp Val Leu Lys Pro Arg Pro
    130                 135                 140

Arg Ser Phe Ser Asp Lys Asn Ser Cys Asn Asp Val Asn Ile Leu Pro
145                 150                 155                 160

Lys Val Asp Val Val Pro Leu His Leu Gly Leu Asn Asn Asn Tyr Val
                165                 170                 175

Cys Glu Ser Ser Ile Thr Cys Asn Lys Asp Glu Gln Lys Asp Lys Leu
            180                 185                 190

Ile Asn Ile Asn Leu Leu Asp Gly Asp Asn Met Trp Trp Glu Ser Leu
        195                 200                 205

Leu Glu Ala Asp Val Leu Gly Pro Glu Ala Thr Glu Thr Ala Lys Gly
    210                 215                 220

Val Thr Leu Pro Leu Asp Phe Glu Gln Ile Trp Ala Arg Phe Asp Glu
225                 230                 235                 240

Glu Thr Leu Glu Leu Asn
                245
```

<210> 483 <211> 972 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(972) <223> G2423

<400> 483

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atg gat gaa aaa gga aga agc ttg aag aac aac aac atg gaa gac gag       48
Met Asp Glu Lys Gly Arg Ser Leu Lys Asn Asn Asn Met Glu Asp Glu
1               5                   10                  15

atg gac cta aag aga ggt ccg tgg act gct gaa gaa gat ttt aag ctc       96
Met Asp Leu Lys Arg Gly Pro Trp Thr Ala Glu Glu Asp Phe Lys Leu
            20                  25                  30

atg aat tac att gct act aat gga gaa ggt cgc tgg aac tct ctt tct      144
Met Asn Tyr Ile Ala Thr Asn Gly Glu Gly Arg Trp Asn Ser Leu Ser
        35                  40                  45

cgt tgc gcc ggc ctc caa cgc acc ggt aaa agc tgt aga cta agg tgg      192
Arg Cys Ala Gly Leu Gln Arg Thr Gly Lys Ser Cys Arg Leu Arg Trp
    50                  55                  60

tta aac tat ctc cgc cct gac gtc cgc cgt gga aac att aca ctt gaa      240
Leu Asn Tyr Leu Arg Pro Asp Val Arg Arg Gly Asn Ile Thr Leu Glu
65                  70                  75                  80
```

```
gaa caa ctc ttg atc ctc gaa ctt cat tcc cgt tgg gga aat aga tgg      288
Glu Gln Leu Leu Ile Leu Glu Leu His Ser Arg Trp Gly Asn Arg Trp
                85                  90                  95

tca aaa atc gca caa tat tta ccg gga aga acg gac aac gag atc aag      336
Ser Lys Ile Ala Gln Tyr Leu Pro Gly Arg Thr Asp Asn Glu Ile Lys
            100                 105                 110

aac tac tgg agg acg cgg gtg caa aag cat gcg aaa cag ttg aaa tgt      384
Asn Tyr Trp Arg Thr Arg Val Gln Lys His Ala Lys Gln Leu Lys Cys
        115                 120                 125

gat gtg aat agc caa caa ttc aaa gac aca atg aag tac ttg tgg atg      432
Asp Val Asn Ser Gln Gln Phe Lys Asp Thr Met Lys Tyr Leu Trp Met
    130                 135                 140

cct cga cta gtc gag agg att cag tca gcc tcg gcc tca tcc gca gca      480
Pro Arg Leu Val Glu Arg Ile Gln Ser Ala Ser Ala Ser Ser Ala Ala
145                 150                 155                 160

gca gcc acc acc aca acc acc acc acc aca gga tca gcc ggc acg tca      528
Ala Ala Thr Thr Thr Thr Thr Thr Thr Thr Gly Ser Ala Gly Thr Ser
                165                 170                 175

tct tgc atc aca acc tct aac aat caa ttc atg aat tac gac tac aac      576
Ser Cys Ile Thr Thr Ser Asn Asn Gln Phe Met Asn Tyr Asp Tyr Asn
            180                 185                 190

aac aac aac atg gga caa cag ttt ggt gta atg agc aac aat gat tat      624
Asn Asn Asn Met Gly Gln Gln Phe Gly Val Met Ser Asn Asn Asp Tyr
        195                 200                 205

atc acg cct gaa aat tcc agc gtg gca gtg tct ccg gcg tca gac tta      672
Ile Thr Pro Glu Asn Ser Ser Val Ala Val Ser Pro Ala Ser Asp Leu
    210                 215                 220

acg gag tac tac agc gct cca aac cct aac ccg gaa tac tat tcg ggt      720
Thr Glu Tyr Tyr Ser Ala Pro Asn Pro Asn Pro Glu Tyr Tyr Ser Gly
225                 230                 235                 240

caa atg ggg aat agt tat tat cca gat cag aat tta gtg agt tca caa      768
Gln Met Gly Asn Ser Tyr Tyr Pro Asp Gln Asn Leu Val Ser Ser Gln
                245                 250                 255

tta tta ccg gat aat tat ttc gac tat agt gga tta tta gac gaa gat      816
Leu Leu Pro Asp Asn Tyr Phe Asp Tyr Ser Gly Leu Leu Asp Glu Asp
            260                 265                 270

cta acg gct atg caa gag cag agt aac ctc agc tgg ttt gaa aac att      864
Leu Thr Ala Met Gln Glu Gln Ser Asn Leu Ser Trp Phe Glu Asn Ile
        275                 280                 285

aat ggt gct gct tct tct tca gac agt tta tgg aac att gga gaa act      912
Asn Gly Ala Ala Ser Ser Ser Asp Ser Leu Trp Asn Ile Gly Glu Thr
    290                 295                 300

gat gaa gaa ttc tgg ttc tta cag cag caa caa cag ttc aac aat aat      960
```

Asp Glu Glu Phe Trp Phe Leu Gln Gln Gln Gln Phe Asn Asn Asn
305 310 315 320

ggt agc ttc tga 972
Gly Ser Phe

<210> 484 <211> 323 <212> PRT <213> Arabidopsis thaliana <400> 484

Met Asp Glu Lys Gly Arg Ser Leu Lys Asn Asn Asn Met Glu Asp Glu
1 5 10 15

Met Asp Leu Lys Arg Gly Pro Trp Thr Ala Glu Glu Asp Phe Lys Leu
20 25 30

Met Asn Tyr Ile Ala Thr Asn Gly Glu Gly Arg Trp Asn Ser Leu Ser
35 40 45

Arg Cys Ala Gly Leu Gln Arg Thr Gly Lys Ser Cys Arg Leu Arg Trp
50 55 60

Leu Asn Tyr Leu Arg Pro Asp Val Arg Arg Gly Asn Ile Thr Leu Glu
65 70 75 80

Glu Gln Leu Leu Ile Leu Glu Leu His Ser Arg Trp Gly Asn Arg Trp
85 90 95

Ser Lys Ile Ala Gln Tyr Leu Pro Gly Arg Thr Asp Asn Glu Ile Lys
100 105 110

Asn Tyr Trp Arg Thr Arg Val Gln Lys His Ala Lys Gln Leu Lys Cys
115 120 125

Asp Val Asn Ser Gln Gln Phe Lys Asp Thr Met Lys Tyr Leu Trp Met
130 135 140

Pro Arg Leu Val Glu Arg Ile Gln Ser Ala Ser Ala Ser Ser Ala Ala
145 150 155 160

Ala Ala Thr Thr Thr Thr Thr Thr Thr Thr Gly Ser Ala Gly Thr Ser
165 170 175

Ser Cys Ile Thr Thr Ser Asn Asn Gln Phe Met Asn Tyr Asp Tyr Asn
180 185 190

Asn Asn Asn Met Gly Gln Gln Phe Gly Val Met Ser Asn Asn Asp Tyr
195 200 205

Ile Thr Pro Glu Asn Ser Ser Val Ala Val Ser Pro Ala Ser Asp Leu
210 215 220

Thr Glu Tyr Tyr Ser Ala Pro Asn Pro Asn Pro Glu Tyr Tyr Ser Gly
225 230 235 240

Gln Met Gly Asn Ser Tyr Tyr Pro Asp Gln Asn Leu Val Ser Ser Gln
245 250 255

Leu Leu Pro Asp Asn Tyr Phe Asp Tyr Ser Gly Leu Leu Asp Glu Asp
260 265 270

Leu Thr Ala Met Gln Glu Gln Ser Asn Leu Ser Trp Phe Glu Asn Ile
275 280 285

Asn Gly Ala Ala Ser Ser Ser Asp Ser Leu Trp Asn Ile Gly Glu Thr
290 295 300

Asp Glu Glu Phe Trp Phe Leu Gln Gln Gln Gln Phe Asn Asn Asn
305 310 315 320

Gly Ser Phe

<210> 485 <211> 849 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(849) <223> G2467

<400> 485
atg gac ccg tcg tca agc tcc aga gca cgg tca atg cca ccg ccg gtg 48
Met Asp Pro Ser Ser Ser Ser Arg Ala Arg Ser Met Pro Pro Pro Val
1 5 10 15

cct atg gag gga ttg cag gaa gca ggg cct tct cct ttt cta aca aag 96
Pro Met Glu Gly Leu Gln Glu Ala Gly Pro Ser Pro Phe Leu Thr Lys
20 25 30

acg ttc gag atg gtt ggt gat cca aac aca aac cac att gtg tct tgg 144
Thr Phe Glu Met Val Gly Asp Pro Asn Thr Asn His Ile Val Ser Trp
35 40 45

aac agg gga ggc atc agt ttt gtc gtg tgg gat cca cat tcc ttc tcg 192
Asn Arg Gly Gly Ile Ser Phe Val Val Trp Asp Pro His Ser Phe Ser
50 55 60

```
gcc act att ctg cct cta tac ttc aag cac aac aac ttc tcc agc ttt      240
Ala Thr Ile Leu Pro Leu Tyr Phe Lys His Asn Asn Phe Ser Ser Phe
65                  70                  75                  80

gtc aga caa ctt aac act tat gga ttc aga aag atc gag gca gag aga      288
Val Arg Gln Leu Asn Thr Tyr Gly Phe Arg Lys Ile Glu Ala Glu Arg
                85                  90                  95

tgg gag ttt atg aat gaa ggt ttc ttg atg ggt cag agg gac ctt ctc      336
Trp Glu Phe Met Asn Glu Gly Phe Leu Met Gly Gln Arg Asp Leu Leu
            100                 105                 110

aaa agc atc aag cga cga acc tcc tct tct tcc cct cct tcg ctt aac      384
Lys Ser Ile Lys Arg Arg Thr Ser Ser Ser Ser Pro Pro Ser Leu Asn
        115                 120                 125

tac tct cag tct cag ccc gag gct cat gac cca ggc gtc gag ctt ccg      432
Tyr Ser Gln Ser Gln Pro Glu Ala His Asp Pro Gly Val Glu Leu Pro
    130                 135                 140

cag ctc cga gaa gag agg cat gtc cta atg atg gag atc tcg acg ctc      480
Gln Leu Arg Glu Glu Arg His Val Leu Met Met Glu Ile Ser Thr Leu
145                 150                 155                 160

aga cag gag gag caa aga gcg aga ggc tac gtc caa gcc atg gag cag      528
Arg Gln Glu Glu Gln Arg Ala Arg Gly Tyr Val Gln Ala Met Glu Gln
                165                 170                 175

agg att aat gga gca gag aag aaa cag agg cat atg atg tcc ttc ttg      576
Arg Ile Asn Gly Ala Glu Lys Lys Gln Arg His Met Met Ser Phe Leu
            180                 185                 190

agg cgt gcg gtg gag aat cct tcc ctt ctg cag cag att ttc gag cag      624
Arg Arg Ala Val Glu Asn Pro Ser Leu Leu Gln Gln Ile Phe Glu Gln
        195                 200                 205

aag aga gac cga gag gag gcc gcg atg att gat cag gct ggc ttg atc      672
Lys Arg Asp Arg Glu Glu Ala Ala Met Ile Asp Gln Ala Gly Leu Ile
    210                 215                 220

aaa atg gaa gag gtg gag cac ctg tcg gag ctg gag gct ctg gcg ctt      720
Lys Met Glu Glu Val Glu His Leu Ser Glu Leu Glu Ala Leu Ala Leu
225                 230                 235                 240

gag atg caa gga tat gga cgg caa cgg act gat ggt gtg gag agg gag      768
Glu Met Gln Gly Tyr Gly Arg Gln Arg Thr Asp Gly Val Glu Arg Glu
                245                 250                 255

ctt gac gac ggg ttt tgg gaa gag tta ctc atg aac aat gaa aac tcc      816
Leu Asp Asp Gly Phe Trp Glu Glu Leu Leu Met Asn Asn Glu Asn Ser
            260                 265                 270

gac gaa gaa gag gcg aat gtg aag caa gat tag                          849
Asp Glu Glu Glu Ala Asn Val Lys Gln Asp
        275                 280
```

<210> 486 <211> 282 <212> PRT <213> Arabidopsis thaliana <400> 486

Met Asp Pro Ser Ser Ser Ser Arg Ala Arg Ser Met Pro Pro Pro Val
1 5 10 15

Pro Met Glu Gly Leu Gln Glu Ala Gly Pro Ser Pro Phe Leu Thr Lys
20 25 30

Thr Phe Glu Met Val Gly Asp Pro Asn Thr Asn His Ile Val Ser Trp
35 40 45

Asn Arg Gly Gly Ile Ser Phe Val Val Trp Asp Pro His Ser Phe Ser
50 55 60

Ala Thr Ile Leu Pro Leu Tyr Phe Lys His Asn Asn Phe Ser Ser Phe
65 70 75 80

Val Arg Gln Leu Asn Thr Tyr Gly Phe Arg Lys Ile Glu Ala Glu Arg
85 90 95

Trp Glu Phe Met Asn Glu Gly Phe Leu Met Gly Gln Arg Asp Leu Leu
100 105 110

Lys Ser Ile Lys Arg Arg Thr Ser Ser Ser Ser Pro Pro Ser Leu Asn
115 120 125

Tyr Ser Gln Ser Gln Pro Glu Ala His Asp Pro Gly Val Glu Leu Pro
130 135 140

Gln Leu Arg Glu Glu Arg His Val Leu Met Met Glu Ile Ser Thr Leu
145 150 155 160

Arg Gln Glu Glu Gln Arg Ala Arg Gly Tyr Val Gln Ala Met Glu Gln
165 170 175

Arg Ile Asn Gly Ala Glu Lys Lys Gln Arg His Met Met Ser Phe Leu
180 185 190

Arg Arg Ala Val Glu Asn Pro Ser Leu Leu Gln Gln Ile Phe Glu Gln
195 200 205

Lys Arg Asp Arg Glu Glu Ala Ala Met Ile Asp Gln Ala Gly Leu Ile
210 215 220

```
Lys Met Glu Glu Val Glu His Leu Ser Glu Leu Glu Ala Leu Ala Leu
225                 230                 235                 240

Glu Met Gln Gly Tyr Gly Arg Gln Arg Thr Asp Gly Val Glu Arg Glu
                245                 250                 255

Leu Asp Asp Gly Phe Trp Glu Glu Leu Leu Met Asn Asn Glu Asn Ser
            260                 265                 270

Asp Glu Glu Glu Ala Asn Val Lys Gln Asp
        275                 280
```

<210> 487 <211> 690 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (112)..(690) <223> G2514

<400> 487

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aaaacttctt catcttcttt aattagtttg ccacctcgca cgtgtgacaa atccttcttc     60

gccacgtgtg aaaacccttc tccggcttgc tactaatata cgactaatag t atg aat     117
                                                        Met Asn
                                                        1

agt tca atg gct tct gcc ggc tta ggt agc cgg aga aag gat ccg gtg      165
Ser Ser Met Ala Ser Ala Gly Leu Gly Ser Arg Arg Lys Asp Pro Val
        5                   10                  15

tac aga gga atc cgg tgc cga agt ggg aaa tgg gtc tcc gag att cgt      213
Tyr Arg Gly Ile Arg Cys Arg Ser Gly Lys Trp Val Ser Glu Ile Arg
    20                  25                  30

gag ccg agg aaa acc acg aga atc tgg ctt gga act tac ccc atg gca      261
Glu Pro Arg Lys Thr Thr Arg Ile Trp Leu Gly Thr Tyr Pro Met Ala
35                  40                  45                  50

gag atg gca gca gcc gcc tat gat gtg gct gct atg gct ctt aaa gga      309
Glu Met Ala Ala Ala Ala Tyr Asp Val Ala Ala Met Ala Leu Lys Gly
                55                  60                  65

aga gaa gct gtc ttg aac ttc cct gga tcc gtc ggg tca tac ccg gtt      357
Arg Glu Ala Val Leu Asn Phe Pro Gly Ser Val Gly Ser Tyr Pro Val
            70                  75                  80

cct gaa tca aca tcc gca gca gat ata cga gcc gct gcg gca gcc gca      405
Pro Glu Ser Thr Ser Ala Ala Asp Ile Arg Ala Ala Ala Ala Ala Ala
        85                  90                  95

gca gca atg aag gga tgt gag gaa ggg gag gag gag aaa aag gca aag      453
Ala Ala Met Lys Gly Cys Glu Glu Gly Glu Glu Glu Lys Lys Ala Lys
    100                 105                 110

gag aag aag agt agt agt tcg aag tcg aga gcg cgt gag tgc cac gta      501
Glu Lys Lys Ser Ser Ser Ser Lys Ser Arg Ala Arg Glu Cys His Val
```

```
115                 120                 125                 130

gat aat gat gtt gga tct tcg tcg tgg tgt ggg aca gag ttc atg gac      549
Asp Asn Asp Val Gly Ser Ser Ser Trp Cys Gly Thr Glu Phe Met Asp
                135                 140                 145

gaa gaa gaa gtc ttg aat atg cct aat ctg ctg gct aat atg gca gaa      597
Glu Glu Glu Val Leu Asn Met Pro Asn Leu Leu Ala Asn Met Ala Glu
            150                 155                 160

ggg atg atg gtt gcg ccg ccg tcg tgg atg ggt tct cgg ccg tcg gat      645
Gly Met Met Val Ala Pro Pro Ser Trp Met Gly Ser Arg Pro Ser Asp
        165                 170                 175

gac tct ccg gag aat tca aat gat gag gac ttg tgg ggc tat tga          690
Asp Ser Pro Glu Asn Ser Asn Asp Glu Asp Leu Trp Gly Tyr
    180                 185                 190
```

Replacement Sheet

<210> 488 <211> 192 <212> PRT <213> Arabidopsis thaliana <400> 488

```
Met Asn Ser Ser Met Ala Ser Ala Gly Leu Gly Ser Arg Arg Lys Asp
1               5                   10                  15

Pro Val Tyr Arg Gly Ile Arg Cys Arg Ser Gly Lys Trp Val Ser Glu
            20                  25                  30

Ile Arg Glu Pro Arg Lys Thr Thr Arg Ile Trp Leu Gly Thr Tyr Pro
        35                  40                  45

Met Ala Glu Met Ala Ala Ala Ala Tyr Asp Val Ala Ala Met Ala Leu
    50                  55                  60

Lys Gly Arg Glu Ala Val Leu Asn Phe Pro Gly Ser Val Gly Ser Tyr
65                  70                  75                  80

Pro Val Pro Glu Ser Thr Ser Ala Ala Asp Ile Arg Ala Ala Ala Ala
                85                  90                  95

Ala Ala Ala Ala Met Lys Gly Cys Glu Glu Gly Glu Glu Glu Lys Lys
            100                 105                 110

Ala Lys Glu Lys Lys Ser Ser Ser Ser Lys Ser Arg Ala Arg Glu Cys
        115                 120                 125

His Val Asp Asn Asp Val Gly Ser Ser Ser Trp Cys Gly Thr Glu Phe
    130                 135                 140
```

```
Met Asp Glu Glu Glu Val Leu Asn Met Pro Asn Leu Leu Ala Asn Met
145                 150                 155                 160

Ala Glu Gly Met Met Val Ala Pro Pro Ser Trp Met Gly Ser Arg Pro
                165                 170                 175

Ser Asp Asp Ser Pro Glu Asn Ser Asn Asp Glu Asp Leu Trp Gly Tyr
            180                 185                 190
```

<210> 489 <211> 994 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS <222> (1)..(711) <223> G2547

<400> 489

```
atg gac caa gaa caa aca cca cat agc cca acc cgc cat agt cgc tca       48
Met Asp Gln Glu Gln Thr Pro His Ser Pro Thr Arg His Ser Arg Ser
1               5                   10                  15

ccc cca tcc tcc gcc tcc ggt tcc acc tca gca gaa ccg gtt cgg tcc       96
Pro Pro Ser Ser Ala Ser Gly Ser Thr Ser Ala Glu Pro Val Arg Ser
            20                  25                  30

cga tgg tca cct aaa ccg gaa caa ata ctc ata ctt gag tcg atc ttc      144
Arg Trp Ser Pro Lys Pro Glu Gln Ile Leu Ile Leu Glu Ser Ile Phe
        35                  40                  45

cac agt ggt atg gtt aac cct ccc aaa gaa gag acg gta agg ata aga      192
His Ser Gly Met Val Asn Pro Pro Lys Glu Glu Thr Val Arg Ile Arg
    50                  55                  60

aag atg ctc gag aaa ttt ggc gcg gtg gga gat gca aat gtc ttc tat      240
Lys Met Leu Glu Lys Phe Gly Ala Val Gly Asp Ala Asn Val Phe Tyr
65                  70                  75                  80

tgg ttt caa aac cgg cgg tca agg tcc cgt cgg aga cag cga cag cta      288
Trp Phe Gln Asn Arg Arg Ser Arg Ser Arg Arg Arg Gln Arg Gln Leu
                85                  90                  95

cag gct gca gct gca gca gcg gac gca acc acc aac act tct agc tct      336
Gln Ala Ala Ala Ala Ala Ala Asp Ala Thr Thr Asn Thr Ser Ser Ser
            100                 105                 110

tct tct tct tat ggt ggt gga tgt gat aat caa agc aat agt ggc atg      384
Ser Ser Ser Tyr Gly Gly Gly Cys Asp Asn Gln Ser Asn Ser Gly Met
        115                 120                 125

gag aat ctc tta aca atg tct ggc caa atg agt tac cat gaa gct act      432
Glu Asn Leu Leu Thr Met Ser Gly Gln Met Ser Tyr His Glu Ala Thr
    130                 135                 140

cat cat cat tat caa aat cat agc tca aat gtc aca tcg att ttg tgc      480
His His His Tyr Gln Asn His Ser Ser Asn Val Thr Ser Ile Leu Cys
145                 150                 155                 160

cca tct gat caa aac tcc aat ttt caa tac caa caa ggg gct ata acg      528
```

```
Pro Ser Asp Gln Asn Ser Asn Phe Gln Tyr Gln Gln Gly Ala Ile Thr
                165                 170                 175

gtg ttt ata aac gga gtt ccg aca gaa gtg acg aga gga gga ata gac      576
Val Phe Ile Asn Gly Val Pro Thr Glu Val Thr Arg Gly Gly Ile Asp
            180                 185                 190

atg aaa gca acg ttt gga gaa gat ttg gtt ttg gtg cat tcc tca ggt      624
Met Lys Ala Thr Phe Gly Glu Asp Leu Val Leu Val His Ser Ser Gly
        195                 200                 205

gtt cct ctt cct act gat gag ttt ggt ttt ttg atg cat agc tta caa      672
Val Pro Leu Pro Thr Asp Glu Phe Gly Phe Leu Met His Ser Leu Gln
    210                 215                 220

cat ggt gaa gct tat ttc ctg gtt cca aga cag aca tga actggcttta       721
His Gly Glu Ala Tyr Phe Leu Val Pro Arg Gln Thr
225                 230                 235

ctcgtatgtg tggtgatgca acagatgtct tgtttttcta ccttggactt tattgcaacg    781

gtccttccat tttttctttt cttttcgagt ctatcgtata atcaaagttt cttctattgg    841

ttttttttta aaaaatttta ttttgcaatt tattttataa agatgaagtc aaaagctctt    901

gtacgacgaa gatatctagg ttgtatcaat ttagttattt agatgtaaaa tacgtatgta    961

taattgattt gcaataaaat ctctgtctag gga                                994
```

<210> 490 <211> 236 <212> PRT <213> Arabidopsis thaliana <400> 490

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Met Asp Gln Glu Gln Thr Pro His Ser Pro Thr Arg His Ser Arg Ser
1               5                   10                  15

Pro Pro Ser Ser Ala Ser Gly Ser Thr Ser Ala Glu Pro Val Arg Ser
            20                  25                  30

Arg Trp Ser Pro Lys Pro Glu Gln Ile Leu Ile Leu Glu Ser Ile Phe
        35                  40                  45

His Ser Gly Met Val Asn Pro Pro Lys Glu Glu Thr Val Arg Ile Arg
    50                  55                  60

Lys Met Leu Glu Lys Phe Gly Ala Val Gly Asp Ala Asn Val Phe Tyr
65                  70                  75                  80

Trp Phe Gln Asn Arg Arg Ser Arg Ser Arg Arg Arg Gln Arg Gln Leu
                85                  90                  95

Gln Ala Ala Ala Ala Ala Ala Ala Asp Ala Thr Thr Asn Thr Ser Ser Ser
```

100 105 110

Ser Ser Ser Tyr Gly Gly Gly Cys Asp Asn Gln Ser Asn Ser Gly Met
115 120 125

Glu Asn Leu Leu Thr Met Ser Gly Gln Met Ser Tyr His Glu Ala Thr
130 135 140

His His His Tyr Gln Asn His Ser Ser Asn Val Thr Ser Ile Leu Cys
145 150 155 160

Pro Ser Asp Gln Asn Ser Asn Phe Gln Tyr Gln Gln Gly Ala Ile Thr
165 170 175

Val Phe Ile Asn Gly Val Pro Thr Glu Val Thr Arg Gly Gly Ile Asp
180 185 190

Met Lys Ala Thr Phe Gly Glu Asp Leu Val Leu Val His Ser Ser Gly
195 200 205

Val Pro Leu Pro Thr Asp Glu Phe Gly Phe Leu Met His Ser Leu Gln
210 215 220

His Gly Glu Ala Tyr Phe Leu Val Pro Arg Gln Thr
225 230 235

<210> 491 <211> 1020 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1020) <223> G2657

<400> 491
atg gat cca gtt caa tct cat gga tca caa agc tct ctt cct cct cct 48
Met Asp Pro Val Gln Ser His Gly Ser Gln Ser Ser Leu Pro Pro Pro
1 5 10 15

ttc cat gct aga gat ttc caa tta cat ctt caa caa caa caa caa cat 96
Phe His Ala Arg Asp Phe Gln Leu His Leu Gln Gln Gln Gln Gln His
20 25 30

caa caa caa cat caa caa caa caa caa caa cag ttc ttt ctc cac cat 144
Gln Gln Gln His Gln Gln Gln Gln Gln Gln Gln Phe Phe Leu His His
35 40 45

cat cag caa cca caa aga aac ctt gat caa gat cac gag cag caa gga 192
His Gln Gln Pro Gln Arg Asn Leu Asp Gln Asp His Glu Gln Gln Gly
50 55 60

ggg tca ata ttg aat aga tct atc aag atg gat cgc gaa gag aca agc 240
Gly Ser Ile Leu Asn Arg Ser Ile Lys Met Asp Arg Glu Glu Thr Ser

```
65                  70                  75                  80

gat aac atg gac aac atc gct aat acc aac agc ggt agc gaa ggt aaa      288
Asp Asn Met Asp Asn Ile Ala Asn Thr Asn Ser Gly Ser Glu Gly Lys
                85                  90                  95

gag atg agt tta cac gga gga gaa gga gga agc ggt ggt gga gga agt      336
Glu Met Ser Leu His Gly Gly Glu Gly Gly Ser Gly Gly Gly Gly Ser
            100                 105                 110

gga gaa cag atg aca aga agg cca aga gga aga cca gca gga tcc aag      384
Gly Glu Gln Met Thr Arg Arg Pro Arg Gly Arg Pro Ala Gly Ser Lys
        115                 120                 125

aac aaa cct aaa gct cca ata atc ata aca aga gac agc gca aac gcg      432
Asn Lys Pro Lys Ala Pro Ile Ile Ile Thr Arg Asp Ser Ala Asn Ala
    130                 135                 140

ctt cga act cac gtc atg gag ata gga gac gga tgt gac ata gtt gac      480
Leu Arg Thr His Val Met Glu Ile Gly Asp Gly Cys Asp Ile Val Asp
145                 150                 155                 160

tgt atg gct acg ttc gct aga cgc cgc caa aga ggc gtt tgc gtt atg      528
Cys Met Ala Thr Phe Ala Arg Arg Arg Gln Arg Gly Val Cys Val Met
                165                 170                 175

agc ggt aca gga agc gtt act aac gtc act ata cgt cag cct gga tcg      576
Ser Gly Thr Gly Ser Val Thr Asn Val Thr Ile Arg Gln Pro Gly Ser
            180                 185                 190

cca cct ggc tcg gtg gtt agc ctt cac ggc cgg ttt gaa atc ctc tct      624
Pro Pro Gly Ser Val Val Ser Leu His Gly Arg Phe Glu Ile Leu Ser
        195                 200                 205

ctt tcg gga tct ttc ttg cct ccg cct gcg ccg cct gca gcc acc gga      672
Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala Pro Pro Ala Ala Thr Gly
    210                 215                 220

cta agc gtt tac cta gcc gga gga caa ggg cag gtc gtt gga ggt agt      720
Leu Ser Val Tyr Leu Ala Gly Gly Gln Gly Gln Val Val Gly Gly Ser
225                 230                 235                 240

gtg gtg gga cct ttg ttg tgt tcg ggt cct gtg gtg gtt atg gcg gct      768
Val Val Gly Pro Leu Leu Cys Ser Gly Pro Val Val Val Met Ala Ala
                245                 250                 255

tct ttt agc aat gcg gcg tac gaa agg ctg cct ttg gaa gaa gat gag      816
Ser Phe Ser Asn Ala Ala Tyr Glu Arg Leu Pro Leu Glu Glu Asp Glu
            260                 265                 270

atg cag acg cca gtt caa gga ggc ggt gga gga gga gga ggt ggt ggt      864
Met Gln Thr Pro Val Gln Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
        275                 280                 285

gga atg gga tct ccc ccg atg atg gga cag caa caa gct atg gca gct      912
Gly Met Gly Ser Pro Pro Met Met Gly Gln Gln Gln Ala Met Ala Ala
    290                 295                 300
```

atg gcg gcg gct caa gga cta cca ccg aat ctt ctt ggt tcg gtt cag 960
Met Ala Ala Ala Gln Gly Leu Pro Pro Asn Leu Leu Gly Ser Val Gln
305 310 315 320

ttg cca ccg cca caa cag aat gat cag cag tat tgg tct acg ggt cgg 1008
Leu Pro Pro Pro Gln Gln Asn Asp Gln Gln Tyr Trp Ser Thr Gly Arg
325 330 335

cca ccg tat tga 1020
Pro Pro Tyr

<210> 492 <211> 339 <212> PRT <213> Arabidopsis thaliana <400> 492

Met Asp Pro Val Gln Ser His Gly Ser Gln Ser Ser Leu Pro Pro Pro
1 5 10 15

Phe His Ala Arg Asp Phe Gln Leu His Leu Gln Gln Gln Gln Gln His
20 25 30

Gln Gln Gln His Gln Gln Gln Gln Gln Gln Gln Phe Phe Leu His His
35 40 45

His Gln Gln Pro Gln Arg Asn Leu Asp Gln Asp His Glu Gln Gln Gly
50 55 60

Gly Ser Ile Leu Asn Arg Ser Ile Lys Met Asp Arg Glu Glu Thr Ser
65 70 75 80

Asp Asn Met Asp Asn Ile Ala Asn Thr Asn Ser Gly Ser Glu Gly Lys
85 90 95

Glu Met Ser Leu His Gly Gly Glu Gly Gly Ser Gly Gly Gly Gly Ser
100 105 110

Gly Glu Gln Met Thr Arg Arg Pro Arg Gly Arg Pro Ala Gly Ser Lys
115 120 125

Asn Lys Pro Lys Ala Pro Ile Ile Ile Thr Arg Asp Ser Ala Asn Ala
130 135 140

Leu Arg Thr His Val Met Glu Ile Gly Asp Gly Cys Asp Ile Val Asp
145 150 155 160

Cys Met Ala Thr Phe Ala Arg Arg Arg Gln Arg Gly Val Cys Val Met

165 170 175

Ser Gly Thr Gly Ser Val Thr Asn Val Thr Ile Arg Gln Pro Gly Ser
180 185 190

Pro Pro Gly Ser Val Val Ser Leu His Gly Arg Phe Glu Ile Leu Ser
195 200 205

Leu Ser Gly Ser Phe Leu Pro Pro Pro Ala Pro Pro Ala Ala Thr Gly
210 215 220

Leu Ser Val Tyr Leu Ala Gly Gly Gln Gly Gln Val Val Gly Gly Ser
225 230 235 240

Val Val Gly Pro Leu Leu Cys Ser Gly Pro Val Val Val Met Ala Ala
245 250 255

Ser Phe Ser Asn Ala Ala Tyr Glu Arg Leu Pro Leu Glu Glu Asp Glu
260 265 270

Met Gln Thr Pro Val Gln Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
275 280 285

Gly Met Gly Ser Pro Pro Met Met Gly Gln Gln Gln Ala Met Ala Ala
290 295 300

Met Ala Ala Ala Gln Gly Leu Pro Pro Asn Leu Leu Gly Ser Val Gln
305 310 315 320

Leu Pro Pro Pro Gln Gln Asn Asp Gln Gln Tyr Trp Ser Thr Gly Arg
325 330 335

Pro Pro Tyr

<210> 493 <211> 880 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (188)..(880) <223> G2659

<400> 493
agtatatatc tatgtacata cgacgacaaa aaaaaatatg tatgtacata catctcctct 60

cactctaagc ttatttttcgt ataaattata gtatagtcat attcttttag gacagaaccc 120

accgaaagaa agctccaaac ccaacaaaaa gggaggcggc ggagaagcaa acaacagcaa 180

```
caaaaaa atg cag cca gag gtt tca gat caa ata ttt tat gcc ttc ctc      229
        Met Gln Pro Glu Val Ser Asp Gln Ile Phe Tyr Ala Phe Leu
        1               5                   10

acc gga gga tta tgt gcc tcg tct act tcc acc acc gtg acg tcg tcg      277
Thr Gly Gly Leu Cys Ala Ser Ser Thr Ser Thr Thr Val Thr Ser Ser
15                  20                  25                  30

tct gac cct ttt gcc acg gtt tat gaa gac aaa gct ctt gct tct ctg      325
Ser Asp Pro Phe Ala Thr Val Tyr Glu Asp Lys Ala Leu Ala Ser Leu
                35                  40                  45

agg aac cat aaa gag gct gag cga aag aga aga gca aga atc aat tcc      373
Arg Asn His Lys Glu Ala Glu Arg Lys Arg Arg Ala Arg Ile Asn Ser
            50                  55                  60

cat ctc aac aag ctc cgc aag tta ctc tct tgt aac tcc aag aca gac      421
His Leu Asn Lys Leu Arg Lys Leu Leu Ser Cys Asn Ser Lys Thr Asp
        65                  70                  75

aaa tcc aca cta cta gca aaa gtg gtt caa cga gtc aaa gaa cta aaa      469
Lys Ser Thr Leu Leu Ala Lys Val Val Gln Arg Val Lys Glu Leu Lys
    80                  85                  90

caa caa acc cta gaa atc acc gac gaa aca ata ccg tcg gag act gac      517
Gln Gln Thr Leu Glu Ile Thr Asp Glu Thr Ile Pro Ser Glu Thr Asp
95                  100                 105                 110

gaa atc agt gta ctc aac att gag gac tgt tcc aga ggc gac gat cga      565
Glu Ile Ser Val Leu Asn Ile Glu Asp Cys Ser Arg Gly Asp Asp Arg
                115                 120                 125

cgg ata atc ttt aag gta tcg ttt tgc tgc gag gac cgg cca gag ctc      613
Arg Ile Ile Phe Lys Val Ser Phe Cys Cys Glu Asp Arg Pro Glu Leu
            130                 135                 140

ttg aaa gat ctc atg gag aca ctc aaa tct ctt cag atg gaa act ctc      661
Leu Lys Asp Leu Met Glu Thr Leu Lys Ser Leu Gln Met Glu Thr Leu
        145                 150                 155

ttt gcc gac atg aca aca gtc ggt ggt cga aca aga aac gtt ctc gtt      709
Phe Ala Asp Met Thr Thr Val Gly Gly Arg Thr Arg Asn Val Leu Val
    160                 165                 170

gtg gcc gct gac aaa gag cat cac ggc gtc cag tcg gtg aat ttt cta      757
Val Ala Ala Asp Lys Glu His His Gly Val Gln Ser Val Asn Phe Leu
175                 180                 185                 190

cag aac gca ctc aag tct tta ctc gaa cgg tca agc aag tcg gtg atg      805
Gln Asn Ala Leu Lys Ser Leu Leu Glu Arg Ser Ser Lys Ser Val Met
                195                 200                 205

gtg gga cat ggt ggt ggt ggt ggg gaa gaa agg tta aaa cga cgt cgt      853
Val Gly His Gly Gly Gly Gly Gly Glu Glu Arg Leu Lys Arg Arg Arg
            210                 215                 220

gcg ctg gat cac atc ata atg gtc tga                                 880
```

Ala Leu Asp His Ile Ile Met Val
225 230

<210> 494 <211> 230 <212> PRT <213> Arabidopsis thaliana <400> 494

Met Gln Pro Glu Val Ser Asp Gln Ile Phe Tyr Ala Phe Leu Thr Gly
1 5 10 15

Gly Leu Cys Ala Ser Ser Thr Ser Thr Thr Val Thr Ser Ser Ser Asp
20 25 30

Pro Phe Ala Thr Val Tyr Glu Asp Lys Ala Leu Ala Ser Leu Arg Asn
35 40 45

His Lys Glu Ala Glu Arg Lys Arg Arg Ala Arg Ile Asn Ser His Leu
50 55 60

Asn Lys Leu Arg Lys Leu Leu Ser Cys Asn Ser Lys Thr Asp Lys Ser
65 70 75 80

Thr Leu Leu Ala Lys Val Val Gln Arg Val Lys Glu Leu Lys Gln Gln
85 90 95

Thr Leu Glu Ile Thr Asp Glu Thr Ile Pro Ser Glu Thr Asp Glu Ile
100 105 110

Ser Val Leu Asn Ile Glu Asp Cys Ser Arg Gly Asp Asp Arg Arg Ile
115 120 125

Ile Phe Lys Val Ser Phe Cys Cys Glu Asp Arg Pro Glu Leu Leu Lys
130 135 140

Asp Leu Met Glu Thr Leu Lys Ser Leu Gln Met Glu Thr Leu Phe Ala
145 150 155 160

Asp Met Thr Thr Val Gly Gly Arg Thr Arg Asn Val Leu Val Val Ala
165 170 175

Ala Asp Lys Glu His His Gly Val Gln Ser Val Asn Phe Leu Gln Asn
180 185 190

Ala Leu Lys Ser Leu Leu Glu Arg Ser Ser Lys Ser Val Met Val Gly
195 200 205

```
His Gly Gly Gly Gly Gly Glu Glu Arg Leu Lys Arg Arg Arg Ala Leu
    210                 215                 220

Asp His Ile Ile Met Val
225                 230
```

<210> 495 <211> 866 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (46)..(837) <223> G2701

<400> 495

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gtgtttgtag ttgaaactta ttcttccctt tttttgtttt taggt atg gag act ctg     57
                                                 Met Glu Thr Leu
                                                 1

cat cca ttc tct cac cta cct atc tct gac cac cgg ttc gtt gtt caa      105
His Pro Phe Ser His Leu Pro Ile Ser Asp His Arg Phe Val Val Gln
5                   10                  15                  20

gag atg gtg agc tta cac agc tcg agt agc ggt agc tgg act aaa gaa      153
Glu Met Val Ser Leu His Ser Ser Ser Ser Gly Ser Trp Thr Lys Glu
                25                  30                  35

gag aac aag atg ttc gaa cga gct ctt gcg ata tac gct gaa gac tcg      201
Glu Asn Lys Met Phe Glu Arg Ala Leu Ala Ile Tyr Ala Glu Asp Ser
            40                  45                  50

cct gat cgc tgg ttt aaa gtt gct tcc atg atc cct gga aag act gtt      249
Pro Asp Arg Trp Phe Lys Val Ala Ser Met Ile Pro Gly Lys Thr Val
        55                  60                  65

ttt gat gtt atg aag caa tat agt aag ctt gaa gaa gac gtt ttc gat      297
Phe Asp Val Met Lys Gln Tyr Ser Lys Leu Glu Glu Asp Val Phe Asp
    70                  75                  80

att gaa gca gga cgt gtt ccc att cct ggt tat cct gca gct tct tct      345
Ile Glu Ala Gly Arg Val Pro Ile Pro Gly Tyr Pro Ala Ala Ser Ser
85                  90                  95                  100

ccc ttg ggg ttt gac acg gac atg tgt cgt aaa cgg cct agt gga gct      393
Pro Leu Gly Phe Asp Thr Asp Met Cys Arg Lys Arg Pro Ser Gly Ala
                105                 110                 115

aga gga tct gat caa gat cga aag aaa gga gtc cct tgg aca gag gaa      441
Arg Gly Ser Asp Gln Asp Arg Lys Lys Gly Val Pro Trp Thr Glu Glu
            120                 125                 130

gaa cac agg aga ttc ttg tta ggc ctt ctc aag tac ggt aaa gga gat      489
Glu His Arg Arg Phe Leu Leu Gly Leu Leu Lys Tyr Gly Lys Gly Asp
        135                 140                 145

tgg aga aac ata tcg aga aac ttc gtg gtg tca aag acg cca acg caa      537
Trp Arg Asn Ile Ser Arg Asn Phe Val Val Ser Lys Thr Pro Thr Gln
    150                 155                 160
```

```
gtg gcg agc cac gcc caa aag tat tac cag aga cag ctc tcc gga gcc      585
Val Ala Ser His Ala Gln Lys Tyr Tyr Gln Arg Gln Leu Ser Gly Ala
165                 170                 175                 180

aag gac aaa cgc agg cca agt atc cat gac atc aca acc ggc aat ctt      633
Lys Asp Lys Arg Arg Pro Ser Ile His Asp Ile Thr Thr Gly Asn Leu
                185                 190                 195

ctc aat gcc aat ctc aac cgt tcc ttt tcc gat cat aga gat att ctc      681
Leu Asn Ala Asn Leu Asn Arg Ser Phe Ser Asp His Arg Asp Ile Leu
            200                 205                 210

cct gat tta ggg ttt atc gat aag gat gat acg gag gag gga gta ata      729
Pro Asp Leu Gly Phe Ile Asp Lys Asp Asp Thr Glu Glu Gly Val Ile
        215                 220                 225

ttt atg ggt cag aat ctc tct tca gaa aat ctg ttt tct cca tca cca      777
Phe Met Gly Gln Asn Leu Ser Ser Glu Asn Leu Phe Ser Pro Ser Pro
    230                 235                 240

act tca ttc gaa gct gcc att aac ttc gcc gga gaa aat gtc ttc agt      825
Thr Ser Phe Glu Ala Ala Ile Asn Phe Ala Gly Glu Asn Val Phe Ser
245                 250                 255                 260

gcc gga gct taa ggcaacatag aatccccaaa ctcagcggc                     866
Ala Gly Ala
```

<210> 496 <211> 263 <212> PRT <213> Arabidopsis thaliana <400> 496

```
Met Glu Thr Leu His Pro Phe Ser His Leu Pro Ile Ser Asp His Arg
1               5                   10                  15

Phe Val Val Gln Glu Met Val Ser Leu His Ser Ser Ser Ser Gly Ser
            20                  25                  30

Trp Thr Lys Glu Glu Asn Lys Met Phe Glu Arg Ala Leu Ala Ile Tyr
        35                  40                  45

Ala Glu Asp Ser Pro Asp Arg Trp Phe Lys Val Ala Ser Met Ile Pro
    50                  55                  60

Gly Lys Thr Val Phe Asp Val Met Lys Gln Tyr Ser Lys Leu Glu Glu
65                  70                  75                  80

Asp Val Phe Asp Ile Glu Ala Gly Arg Val Pro Ile Pro Gly Tyr Pro
                85                  90                  95

Ala Ala Ser Ser Pro Leu Gly Phe Asp Thr Asp Met Cys Arg Lys Arg
            100                 105                 110
```

Pro Ser Gly Ala Arg Gly Ser Asp Gln Asp Arg Lys Lys Gly Val Pro
115 120 125

Trp Thr Glu Glu Glu His Arg Arg Phe Leu Leu Gly Leu Leu Lys Tyr
130 135 140

Gly Lys Gly Asp Trp Arg Asn Ile Ser Arg Asn Phe Val Val Ser Lys
145 150 155 160

Thr Pro Thr Gln Val Ala Ser His Ala Gln Lys Tyr Tyr Gln Arg Gln
165 170 175

Leu Ser Gly Ala Lys Asp Lys Arg Arg Pro Ser Ile His Asp Ile Thr
180 185 190

Thr Gly Asn Leu Leu Asn Ala Asn Leu Asn Arg Ser Phe Ser Asp His
195 200 205

Arg Asp Ile Leu Pro Asp Leu Gly Phe Ile Asp Lys Asp Asp Thr Glu
210 215 220

Glu Gly Val Ile Phe Met Gly Gln Asn Leu Ser Ser Glu Asn Leu Phe
225 230 235 240

Ser Pro Ser Pro Thr Ser Phe Glu Ala Ala Ile Asn Phe Ala Gly Glu
245 250 255

Asn Val Phe Ser Ala Gly Ala
260

<210> 497 <211> 972 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(972) <223> G2741

<400> 497
atg gga gag gaa gta caa atg agc gat tac gat gtt tcc ggc gac gga 48
Met Gly Glu Glu Val Gln Met Ser Asp Tyr Asp Val Ser Gly Asp Gly
1 5 10 15

gat agg gtt tct gaa tgg gag atg gga tta cca agc gac gaa gat cta 96
Asp Arg Val Ser Glu Trp Glu Met Gly Leu Pro Ser Asp Glu Asp Leu
20 25 30

gca tct ctt tct tac tct ctg att cca ccg aat ttg gcg atg gcg ttt 144
Ala Ser Leu Ser Tyr Ser Leu Ile Pro Pro Asn Leu Ala Met Ala Phe
35 40 45

```
agt atc aca ccg gag aga agc cgt acg att cag gat gtg aat cgt gca      192
Ser Ile Thr Pro Glu Arg Ser Arg Thr Ile Gln Asp Val Asn Arg Ala
    50                  55                  60

tcg gag acg acg ctc tcg tcg cta cgt ggt gga tct tca ggt cca aat      240
Ser Glu Thr Thr Leu Ser Ser Leu Arg Gly Gly Ser Ser Gly Pro Asn
65                  70                  75                  80

acc tcg tcg tcg aat aat aac gtg gag gag gaa gat cga gtt gga tct      288
Thr Ser Ser Ser Asn Asn Asn Val Glu Glu Glu Asp Arg Val Gly Ser
                85                  90                  95

agc agt cct gga tcg gat tcg aag aag caa aag aca tca aac ggt gat      336
Ser Ser Pro Gly Ser Asp Ser Lys Lys Gln Lys Thr Ser Asn Gly Asp
            100                 105                 110

gga gat gac ggt ggc ggt gtg gat ccg gat tcg gcg atg gcg gcg gaa      384
Gly Asp Asp Gly Gly Gly Val Asp Pro Asp Ser Ala Met Ala Ala Glu
        115                 120                 125

gaa gga gat tca gga act gaa gat cta tct ggg aaa aca ctt aaa cga      432
Glu Gly Asp Ser Gly Thr Glu Asp Leu Ser Gly Lys Thr Leu Lys Arg
    130                 135                 140

ccg cgt tta gtg tgg aca ccg cag cta cac aag aga ttc gtt gac gtt      480
Pro Arg Leu Val Trp Thr Pro Gln Leu His Lys Arg Phe Val Asp Val
145                 150                 155                 160

gta gct cac tta ggg atc aaa aac gct gtt ccg aag acg att atg cag      528
Val Ala His Leu Gly Ile Lys Asn Ala Val Pro Lys Thr Ile Met Gln
                165                 170                 175

ctg atg aac gtt gaa gga tta act cgt gag aac gtt gcg tct cat ctt      576
Leu Met Asn Val Glu Gly Leu Thr Arg Glu Asn Val Ala Ser His Leu
            180                 185                 190

caa aag tat agg ctt tac ctc aaa agg atg cag gga ttg act aat gaa      624
Gln Lys Tyr Arg Leu Tyr Leu Lys Arg Met Gln Gly Leu Thr Asn Glu
        195                 200                 205

ggt ccc tct gct tcg gat aag ctc ttc tct tca aca cct gtt cct cca      672
Gly Pro Ser Ala Ser Asp Lys Leu Phe Ser Ser Thr Pro Val Pro Pro
    210                 215                 220

cag agc ttc caa gat atc ggt ggc ggt ggc ggt agc agc ggt aat gtt      720
Gln Ser Phe Gln Asp Ile Gly Gly Gly Gly Gly Ser Ser Gly Asn Val
225                 230                 235                 240

gga gtg ccg att ccg ggg gcg tat gga acg caa cag atg atg cag atg      768
Gly Val Pro Ile Pro Gly Ala Tyr Gly Thr Gln Gln Met Met Gln Met
                245                 250                 255

cca gtt tat gca cat cat atg ggt atg caa gga tat cat cat caa aat      816
Pro Val Tyr Ala His His Met Gly Met Gln Gly Tyr His His Gln Asn
            260                 265                 270
```

```
cat aat cat gat cct tat cat cag aat cat cgt cat cat cat gga gct      864
His Asn His Asp Pro Tyr His Gln Asn His Arg His His His Gly Ala
        275                 280                 285

ggt gga aat ggt gcg ttt gag tca aat cct tat atg atg cag cag aat      912
Gly Gly Asn Gly Ala Phe Glu Ser Asn Pro Tyr Met Met Gln Gln Asn
    290                 295                 300

aag ttt gga tcc atg gct tct tat cct tct gtt gga ggt gga agc gca      960
Lys Phe Gly Ser Met Ala Ser Tyr Pro Ser Val Gly Gly Gly Ser Ala
305                 310                 315                 320

aat gag aat taa                                                      972
Asn Glu Asn
```

<210> 498 <211> 323 <212> PRT <213> Arabidopsis thaliana <400> 498

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Met Gly Glu Glu Val Gln Met Ser Asp Tyr Asp Val Ser Gly Asp Gly
1               5                   10                  15

Asp Arg Val Ser Glu Trp Glu Met Gly Leu Pro Ser Asp Glu Asp Leu
            20                  25                  30

Ala Ser Leu Ser Tyr Ser Leu Ile Pro Pro Asn Leu Ala Met Ala Phe
        35                  40                  45

Ser Ile Thr Pro Glu Arg Ser Arg Thr Ile Gln Asp Val Asn Arg Ala
    50                  55                  60

Ser Glu Thr Thr Leu Ser Ser Leu Arg Gly Gly Ser Ser Gly Pro Asn
65                  70                  75                  80

Thr Ser Ser Ser Asn Asn Asn Val Glu Glu Glu Asp Arg Val Gly Ser
                85                  90                  95

Ser Ser Pro Gly Ser Asp Ser Lys Lys Gln Lys Thr Ser Asn Gly Asp
            100                 105                 110

Gly Asp Asp Gly Gly Gly Val Asp Pro Asp Ser Ala Met Ala Ala Glu
        115                 120                 125

Glu Gly Asp Ser Gly Thr Glu Asp Leu Ser Gly Lys Thr Leu Lys Arg
    130                 135                 140

Pro Arg Leu Val Trp Thr Pro Gln Leu His Lys Arg Phe Val Asp Val
145                 150                 155                 160
```

Val Ala His Leu Gly Ile Lys Asn Ala Val Pro Lys Thr Ile Met Gln
165 170 175

Leu Met Asn Val Glu Gly Leu Thr Arg Glu Asn Val Ala Ser His Leu
180 185 190

Gln Lys Tyr Arg Leu Tyr Leu Lys Arg Met Gln Gly Leu Thr Asn Glu
195 200 205

Gly Pro Ser Ala Ser Asp Lys Leu Phe Ser Ser Thr Pro Val Pro Pro
210 215 220

Gln Ser Phe Gln Asp Ile Gly Gly Gly Gly Gly Ser Ser Gly Asn Val
225 230 235 240

Gly Val Pro Ile Pro Gly Ala Tyr Gly Thr Gln Gln Met Met Gln Met
245 250 255

Pro Val Tyr Ala His His Met Gly Met Gln Gly Tyr His His Gln Asn
260 265 270

His Asn His Asp Pro Tyr His Gln Asn His Arg His His His Gly Ala
275 280 285

Gly Gly Asn Gly Ala Phe Glu Ser Asn Pro Tyr Met Met Gln Gln Asn
290 295 300

Lys Phe Gly Ser Met Ala Ser Tyr Pro Ser Val Gly Gly Gly Ser Ala
305 310 315 320

Asn Glu Asn

<210> 499 <211> 1362 <212> DNA <213> Arabidopsis thaliana <220> <221> CDS
<222> (1)..(1362) <223> G2781

<400> 499
atg gat caa aaa agt aaa acg att gga gaa caa tgg tgg agg tca aat 48
Met Asp Gln Lys Ser Lys Thr Ile Gly Glu Gln Trp Trp Arg Ser Asn
1 5 10 15

cca acg ttt aaa ccg cct gaa acg cca tta gat tct atg gag ttt ttg 96
Pro Thr Phe Lys Pro Pro Glu Thr Pro Leu Asp Ser Met Glu Phe Leu
20 25 30

```
tca cgt act tgg agt gct tcc gct act gaa gtt tca aga gct gtc gtc      144
Ser Arg Thr Trp Ser Ala Ser Ala Thr Glu Val Ser Arg Ala Val Val
        35                  40                  45

gcg tct cca ccg act tct caa ccg ccg caa atg cgt ttc tcg gag atc      192
Ala Ser Pro Pro Thr Ser Gln Pro Pro Gln Met Arg Phe Ser Glu Ile
    50                  55                  60

caa aac ggt tct tct gac gtc act ttg gtg ccg gaa gat gaa gaa aac      240
Gln Asn Gly Ser Ser Asp Val Thr Leu Val Pro Glu Asp Glu Glu Asn
65                  70                  75                  80

ggc atc gtt ctt gga aat act ttt tct ttt gct tct tca gaa act tct      288
Gly Ile Val Leu Gly Asn Thr Phe Ser Phe Ala Ser Ser Glu Thr Ser
                85                  90                  95

tta atg gtc atg gaa cgt atc atg gct cag tca ccg gag att tca tcg      336
Leu Met Val Met Glu Arg Ile Met Ala Gln Ser Pro Glu Ile Ser Ser
            100                 105                 110

cca cga aca tca ggg aga ctt tct cat agc tca ttc acc gac agt cct      384
Pro Arg Thr Ser Gly Arg Leu Ser His Ser Ser Phe Thr Asp Ser Pro
        115                 120                 125

ccg atc tct ccc tcc gac atc gac gac ttt aag caa ttc tac cgt gtg      432
Pro Ile Ser Pro Ser Asp Ile Asp Asp Phe Lys Gln Phe Tyr Arg Val
    130                 135                 140

agc cct tcc ttt aac ggc cac ata cgt ggt tca tca gcc att ccc ggc      480
Ser Pro Ser Phe Asn Gly His Ile Arg Gly Ser Ser Ala Ile Pro Gly
145                 150                 155                 160

acc gcc gga ggg tct aaa act gtt ggt cgt tgg cta aag gac cgg cga      528
Thr Ala Gly Gly Ser Lys Thr Val Gly Arg Trp Leu Lys Asp Arg Arg
                165                 170                 175

gag aag aag aga gaa gag acg cgt gca caa aat gca cag ctt cac gcg      576
Glu Lys Lys Arg Glu Glu Thr Arg Ala Gln Asn Ala Gln Leu His Ala
            180                 185                 190

gct gta tct gta gct gga gtg gct gcc gcg gtg gct gct atc gct gca      624
Ala Val Ser Val Ala Gly Val Ala Ala Ala Val Ala Ala Ile Ala Ala
        195                 200                 205

gcc act gcc tct cag tcg agt tct gga act gac gag caa gtg gcc aaa      672
Ala Thr Ala Ser Gln Ser Ser Ser Gly Thr Asp Glu Gln Val Ala Lys
    210                 215                 220

aat gac tcc gcg gtg gct tct gcc gcg act ttg gtg gcg gcg aag tgt      720
Asn Asp Ser Ala Val Ala Ser Ala Ala Thr Leu Val Ala Ala Lys Cys
225                 230                 235                 240

gtg gaa gct gca gag att atg gga gct gat cgt gag cac ttg gcc tcc      768
Val Glu Ala Ala Glu Ile Met Gly Ala Asp Arg Glu His Leu Ala Ser
                245                 250                 255
```

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gtt gtt agt tct gcg gtt aac gtt cgt tct gcc gga gat atc atg act      816
Val Val Ser Ser Ala Val Asn Val Arg Ser Ala Gly Asp Ile Met Thr
            260                 265                 270

ttg acc gcc gct gct gcc aca gct ttg aga gga gct gca caa tta aag      864
Leu Thr Ala Ala Ala Ala Thr Ala Leu Arg Gly Ala Ala Gln Leu Lys
        275                 280                 285

gca aga gca ttg aag gag gta tgg aac att gcg gct gtg att cct gta      912
Ala Arg Ala Leu Lys Glu Val Trp Asn Ile Ala Ala Val Ile Pro Val
    290                 295                 300

gat aag ggt aca cca aaa ggc ggt ggt ggt ggt tat aga ggt ggc gag      960
Asp Lys Gly Thr Pro Lys Gly Gly Gly Gly Gly Tyr Arg Gly Gly Glu
305                 310                 315                 320

tta gcc cct gta gat aat ttt ctt ggg att tgc agt aaa gaa ttg cta     1008
Leu Ala Pro Val Asp Asn Phe Leu Gly Ile Cys Ser Lys Glu Leu Leu
                325                 330                 335

gct aaa ggt tgc gaa ttg ctt aaa cgc acc cgc aaa ggt gat ctt cat     1056
Ala Lys Gly Cys Glu Leu Leu Lys Arg Thr Arg Lys Gly Asp Leu His
            340                 345                 350

tgg aaa gtt gtt tcg atc tac att aat aga aca aag cag gta ata ttg     1104
Trp Lys Val Val Ser Ile Tyr Ile Asn Arg Thr Lys Gln Val Ile Leu
        355                 360                 365

aag act aag agc aaa cat gtt gct ggg acc atc aca aag aag aaa aag     1152
Lys Thr Lys Ser Lys His Val Ala Gly Thr Ile Thr Lys Lys Lys Lys
    370                 375                 380

aat gtg gtg gtg gga ttg gtt aag gga tta ccg gcg tgg cct ggc cgg     1200
Asn Val Val Val Gly Leu Val Lys Gly Leu Pro Ala Trp Pro Gly Arg
385                 390                 395                 400

gaa atg ctc gag ggt gga gag aat ttg agg tat ttc ggg ctg aag acg     1248
Glu Met Leu Glu Gly Gly Glu Asn Leu Arg Tyr Phe Gly Leu Lys Thr
                405                 410                 415

gtg gag aaa aga gtg att gaa ttc gag tgc aaa agc caa agg gaa tat     1296
Val Glu Lys Arg Val Ile Glu Phe Glu Cys Lys Ser Gln Arg Glu Tyr
            420                 425                 430

gat ctt tgg aca caa ggt gtt tcc atg ctt ctt tcc att gct tct gat     1344
Asp Leu Trp Thr Gln Gly Val Ser Met Leu Leu Ser Ile Ala Ser Asp
        435                 440                 445

agg aaa cat aaa tgt tga                                             1362
Arg Lys His Lys Cys
    450
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1               5                   10                  15
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Pro Thr Phe Lys Pro Pro Glu Thr Pro Leu Asp Ser Met Glu Phe Leu
20 25 30

Ser Arg Thr Trp Ser Ala Ser Ala Thr Glu Val Ser Arg Ala Val Val
35 40 45

Ala Ser Pro Pro Thr Ser Gln Pro Pro Gln Met Arg Phe Ser Glu Ile
50 55 60

Gln Asn Gly Ser Ser Asp Val Thr Leu Val Pro Glu Asp Glu Glu Asn
65 70 75 80

Gly Ile Val Leu Gly Asn Thr Phe Ser Phe Ala Ser Ser Glu Thr Ser
85 90 95

Leu Met Val Met Glu Arg Ile Met Ala Gln Ser Pro Glu Ile Ser Ser
100 105 110

Pro Arg Thr Ser Gly Arg Leu Ser His Ser Ser Phe Thr Asp Ser Pro
115 120 125

Pro Ile Ser Pro Ser Asp Ile Asp Asp Phe Lys Gln Phe Tyr Arg Val
130 135 140

Ser Pro Ser Phe Asn Gly His Ile Arg Gly Ser Ser Ala Ile Pro Gly
145 150 155 160

Thr Ala Gly Gly Ser Lys Thr Val Gly Arg Trp Leu Lys Asp Arg Arg
165 170 175

Glu Lys Lys Arg Glu Glu Thr Arg Ala Gln Asn Ala Gln Leu His Ala
180 185 190

Ala Val Ser Val Ala Gly Val Ala Ala Ala Val Ala Ala Ile Ala Ala
195 200 205

Ala Thr Ala Ser Gln Ser Ser Ser Gly Thr Asp Glu Gln Val Ala Lys
210 215 220

Asn Asp Ser Ala Val Ala Ser Ala Ala Thr Leu Val Ala Ala Lys Cys
225 230 235 240

Val Glu Ala Ala Glu Ile Met Gly Ala Asp Arg Glu His Leu Ala Ser
245 250 255

Val Val Ser Ser Ala Val Asn Val Arg Ser Ala Gly Asp Ile Met Thr
260 265 270

Leu Thr Ala Ala Ala Ala Thr Ala Leu Arg Gly Ala Ala Gln Leu Lys
275 280 285

Ala Arg Ala Leu Lys Glu Val Trp Asn Ile Ala Ala Val Ile Pro Val
290 295 300

Asp Lys Gly Thr Pro Lys Gly Gly Gly Gly Gly Tyr Arg Gly Gly Glu
305 310 315 320

Leu Ala Pro Val Asp Asn Phe Leu Gly Ile Cys Ser Lys Glu Leu Leu
325 330 335

Ala Lys Gly Cys Glu Leu Leu Lys Arg Thr Arg Lys Gly Asp Leu His
340 345 350

Trp Lys Val Val Ser Ile Tyr Ile Asn Arg Thr Lys Gln Val Ile Leu
355 360 365

Lys Thr Lys Ser Lys His Val Ala Gly Thr Ile Thr Lys Lys Lys Lys
370 375 380

Asn Val Val Val Gly Leu Val Lys Gly Leu Pro Ala Trp Pro Gly Arg
385 390 395 400

Glu Met Leu Glu Gly Gly Glu Asn Leu Arg Tyr Phe Gly Leu Lys Thr
405 410 415

Val Glu Lys Arg Val Ile Glu Phe Glu Cys Lys Ser Gln Arg Glu Tyr
420 425 430

Asp Leu Trp Thr Gln Gly Val Ser Met Leu Leu Ser Ile Ala Ser Asp
435 440 445

Arg Lys His Lys Cys
450

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Met Val Ala Arg Ser Glu Glu Val Glu Ile Val Glu Asp Thr Ala Ala
1               5                   10                  15

aaa tgt ttg atg ttg tta tca aga gtt gga gaa tgc ggc gga gga gga       96
Lys Cys Leu Met Leu Leu Ser Arg Val Gly Glu Cys Gly Gly Gly Gly
            20                  25                  30

gag aaa cga gtt ttc cga tgc aag act tgt ctt aaa gag ttt tcg tcg      144
Glu Lys Arg Val Phe Arg Cys Lys Thr Cys Leu Lys Glu Phe Ser Ser
        35                  40                  45

ttt caa gct ttg gga ggt cat cgt gca agc cac aag aaa ctc att aac      192
Phe Gln Ala Leu Gly Gly His Arg Ala Ser His Lys Lys Leu Ile Asn
    50                  55                  60

agt agc gat cca tca ctt ctt gga tcc ttg tct aac aag aaa act aaa      240
Ser Ser Asp Pro Ser Leu Leu Gly Ser Leu Ser Asn Lys Lys Thr Lys
65                  70                  75                  80

acg gcg acg tct cat cct tgt ccg ata tgt ggc gtg gag ttt ccg atg      288
Thr Ala Thr Ser His Pro Cys Pro Ile Cys Gly Val Glu Phe Pro Met
                85                  90                  95

ggg caa gct ctt ggt ggt cac atg agg aga cat agg agt gag aaa gcc      336
Gly Gln Ala Leu Gly Gly His Met Arg Arg His Arg Ser Glu Lys Ala
            100                 105                 110

tca cca ggc acg ttg gtt aca cgt tct ttt tta ccg gag acg acg acg      384
Ser Pro Gly Thr Leu Val Thr Arg Ser Phe Leu Pro Glu Thr Thr Thr
        115                 120                 125

gtg acg act ttg aaa aaa tcg agt agt ggg aag aga gtg gct tgt ttg      432
Val Thr Thr Leu Lys Lys Ser Ser Ser Gly Lys Arg Val Ala Cys Leu
    130                 135                 140

gac tta gat tcg atg gag agt tta gtc aat tgg aag ttg gag ttg gga      480
Asp Leu Asp Ser Met Glu Ser Leu Val Asn Trp Lys Leu Glu Leu Gly
145                 150                 155                 160

aga acg att tct tga                                                 495
Arg Thr Ile Ser
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1               5                   10                  15

Lys Cys Leu Met Leu Leu Ser Arg Val Gly Glu Cys Gly Gly Gly Gly
            20                  25                  30
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Glu Lys Arg Val Phe Arg Cys Lys Thr Cys Leu Lys Glu Phe Ser Ser
35 40 45

Phe Gln Ala Leu Gly Gly His Arg Ala Ser His Lys Lys Leu Ile Asn
50 55 60

Ser Ser Asp Pro Ser Leu Leu Gly Ser Leu Ser Asn Lys Lys Thr Lys
65 70 75 80

Thr Ala Thr Ser His Pro Cys Pro Ile Cys Gly Val Glu Phe Pro Met
85 90 95

Gly Gln Ala Leu Gly Gly His Met Arg Arg His Arg Ser Glu Lys Ala
100 105 110

Ser Pro Gly Thr Leu Val Thr Arg Ser Phe Leu Pro Glu Thr Thr Thr
115 120 125

Val Thr Thr Leu Lys Lys Ser Ser Ser Gly Lys Arg Val Ala Cys Leu
130 135 140

Asp Leu Asp Ser Met Glu Ser Leu Val Asn Trp Lys Leu Glu Leu Gly
145 150 155 160

Arg Thr Ile Ser

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tccctcttac tcaaggttct tctttgtcat cttgttgccg aatccacaaa gaggagaata 120

aagattcgac ctttattaga tattaacgac tctggatttt tgggtttttg gagttggatc 180

cac atg ggt tct tat ccg gat gga ttc cct gga tcc atg gac gag ttg 228
Met Gly Ser Tyr Pro Asp Gly Phe Pro Gly Ser Met Asp Glu Leu
1 5 10 15

gat ttc aat aag gac ttt gat ttg cct ccc tcc tca aac caa acc tta 276
Asp Phe Asn Lys Asp Phe Asp Leu Pro Pro Ser Ser Asn Gln Thr Leu
20 25 30

ggt tta gct aat ggg ttc tat tta gat gac tta gat ttc tca tcc ttg 324

```
Gly Leu Ala Asn Gly Phe Tyr Leu Asp Asp Leu Asp Phe Ser Ser Leu
            35                  40                  45

gat cct cca gag gca tat ccc tcc cag aac aac aac aac aac aac atc      372
Asp Pro Pro Glu Ala Tyr Pro Ser Gln Asn Asn Asn Asn Asn Asn Ile
        50                  55                  60

aac aac aaa gct gta gca gga gat ctg tta tca tct tca tct gat gac      420
Asn Asn Lys Ala Val Ala Gly Asp Leu Leu Ser Ser Ser Ser Asp Asp
    65                  70                  75

gct gat ttc tct gat tct gtt ttg aag tat ata agc caa gtt ctt atg      468
Ala Asp Phe Ser Asp Ser Val Leu Lys Tyr Ile Ser Gln Val Leu Met
80                  85                  90                  95

gaa gag gat atg gaa gag aag cct tgt atg ttt cat gac gct ttg gct      516
Glu Glu Asp Met Glu Glu Lys Pro Cys Met Phe His Asp Ala Leu Ala
                100                 105                 110

ctt caa gct gct gag aaa tct ctc tat gag gct ctt ggt gag aaa tac      564
Leu Gln Ala Ala Glu Lys Ser Leu Tyr Glu Ala Leu Gly Glu Lys Tyr
            115                 120                 125

cct tct tcg tct tct gct tct tct gtg gat cat cct gag aga ttg gct      612
Pro Ser Ser Ser Ser Ala Ser Ser Val Asp His Pro Glu Arg Leu Ala
        130                 135                 140

agt gat agc cct gac ggt tct tgt tca ggt ggt gct ttt agt gat tac      660
Ser Asp Ser Pro Asp Gly Ser Cys Ser Gly Gly Ala Phe Ser Asp Tyr
    145                 150                 155

gct agc acc act acc act act tcc tct gat tct cac tgg agt gtt gat      708
Ala Ser Thr Thr Thr Thr Thr Ser Ser Asp Ser His Trp Ser Val Asp
160                 165                 170                 175

ggt ttg gag aat aga cct tct tgg tta cat aca cct atg ccg agt aat      756
Gly Leu Glu Asn Arg Pro Ser Trp Leu His Thr Pro Met Pro Ser Asn
                180                 185                 190

ttt gtt ttc cag tct act tct agg tcc aac agt gtc acc ggt ggt ggt      804
Phe Val Phe Gln Ser Thr Ser Arg Ser Asn Ser Val Thr Gly Gly Gly
            195                 200                 205

ggt ggt ggt aat agt gcg gtt tac ggt tca ggt ttt ggc gat gat ttg      852
Gly Gly Gly Asn Ser Ala Val Tyr Gly Ser Gly Phe Gly Asp Asp Leu
        210                 215                 220

gtt tcg aat atg ttt aaa gat gat gaa ttg gct atg cag ttc aag aaa      900
Val Ser Asn Met Phe Lys Asp Asp Glu Leu Ala Met Gln Phe Lys Lys
    225                 230                 235

ggg gtt gag gaa gct agt aag ttc ctt cct aag tct tct cag ctc ttt      948
Gly Val Glu Glu Ala Ser Lys Phe Leu Pro Lys Ser Ser Gln Leu Phe
240                 245                 250                 255

att gat gtg gat agt tac atc cct atg aat tct ggt tcc aag gaa aat      996
Ile Asp Val Asp Ser Tyr Ile Pro Met Asn Ser Gly Ser Lys Glu Asn
```

Replacement Sheet

Replacement Sheet - 5/5/2009

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                260                 265                 270

ggt tct gag gtt ttt gtt aag acg gag aag aaa gat gag aca gag cat     1044
Gly Ser Glu Val Phe Val Lys Thr Glu Lys Lys Asp Glu Thr Glu His
            275                 280                 285

cat cat cat cat agc tat gct cct cct ccc aac aga tta act ggt aag     1092
His His His His Ser Tyr Ala Pro Pro Pro Asn Arg Leu Thr Gly Lys
        290                 295                 300

aaa agc cat tgg cgc gac gaa gat gaa gat ttc gtt gaa gaa aga agt     1140
Lys Ser His Trp Arg Asp Glu Asp Glu Asp Phe Val Glu Glu Arg Ser
    305                 310                 315

aac aag caa tca gct gtt tat gtt gag gaa agc gag ctt tct gaa atg     1188
Asn Lys Gln Ser Ala Val Tyr Val Glu Glu Ser Glu Leu Ser Glu Met
320                 325                 330                 335

ttt gat aag atc ttg gta tgt ggc cct ggg aaa cct gta tgc att ctt     1236
Phe Asp Lys Ile Leu Val Cys Gly Pro Gly Lys Pro Val Cys Ile Leu
                340                 345                 350

aac cag aac ttt cct aca gaa tcc gct aaa gtc gtg acc gca cag tca     1284
Asn Gln Asn Phe Pro Thr Glu Ser Ala Lys Val Val Thr Ala Gln Ser
            355                 360                 365

aat gga gca aag att cgt ggg aag aaa tca act tct act agt cat agt     1332
Asn Gly Ala Lys Ile Arg Gly Lys Lys Ser Thr Ser Thr Ser His Ser
        370                 375                 380

aac gat tct aag aaa gaa act gct gat ttg agg act ctt ttg gtg tta     1380
Asn Asp Ser Lys Lys Glu Thr Ala Asp Leu Arg Thr Leu Leu Val Leu
    385                 390                 395

tgt gca caa gct gta tca gtg gat gat cgt aga acc gcc aac gaa atg     1428
Cys Ala Gln Ala Val Ser Val Asp Asp Arg Arg Thr Ala Asn Glu Met
400                 405                 410                 415

cta agg cag ata cga gag cat tct tcg cct cta ggc aat ggt tca gag     1476
Leu Arg Gln Ile Arg Glu His Ser Ser Pro Leu Gly Asn Gly Ser Glu
                420                 425                 430

cgg ttg gct cat tat ttt gca aat agt ctt gaa gca cgc tta gct ggg     1524
Arg Leu Ala His Tyr Phe Ala Asn Ser Leu Glu Ala Arg Leu Ala Gly
            435                 440                 445

acc ggt aca cag atc tac acc gct tta tct tcg aag aaa acg tct gca     1572
Thr Gly Thr Gln Ile Tyr Thr Ala Leu Ser Ser Lys Lys Thr Ser Ala
        450                 455                 460

gca gac atg ttg aag gct tac cag aca tac atg tcg gtc tgc cct ttc     1620
Ala Asp Met Leu Lys Ala Tyr Gln Thr Tyr Met Ser Val Cys Pro Phe
    465                 470                 475

aag aaa gct gct atc ata ttt gct aac cac agc atg atg cgt ttc act     1668
Lys Lys Ala Ala Ile Ile Phe Ala Asn His Ser Met Met Arg Phe Thr
480                 485                 490                 495
```

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gca aac gcc aac acg atc cac ata ata gat ttc gga ata tct tac ggt     1716
Ala Asn Ala Asn Thr Ile His Ile Ile Asp Phe Gly Ile Ser Tyr Gly
                500                 505                 510

ttt cag tgg cct gct ctg att cat cgc ctc tcg ctc agc aga cct ggt     1764
Phe Gln Trp Pro Ala Leu Ile His Arg Leu Ser Leu Ser Arg Pro Gly
            515                 520                 525

ggt tcg cct aag ctt cga att acc ggt ata gag ctt cct cag cgc ggt     1812
Gly Ser Pro Lys Leu Arg Ile Thr Gly Ile Glu Leu Pro Gln Arg Gly
        530                 535                 540

ttt aga cca gcg gaa gag ttc agg aga cag gtc atc gct tgg ctc gat     1860
Phe Arg Pro Ala Glu Glu Phe Arg Arg Gln Val Ile Ala Trp Leu Asp
    545                 550                 555

act gtc agc gac aca atg ttc cgt ttg agt aca acg caa ttg ctc aga     1908
Thr Val Ser Asp Thr Met Phe Arg Leu Ser Thr Thr Gln Leu Leu Arg
560                 565                 570                 575

aat ggg gaa acg atc caa gtc gaa gac tta aag ctt cga caa gga gag     1956
Asn Gly Glu Thr Ile Gln Val Glu Asp Leu Lys Leu Arg Gln Gly Glu
                580                 585                 590

tat gtg gtt gtg aac tct ttg ttc cgt ttc agg aac ctt cta gat gag     2004
Tyr Val Val Val Asn Ser Leu Phe Arg Phe Arg Asn Leu Leu Asp Glu
            595                 600                 605

acc gtt ctg gta aac agc ccg aga gat gca gtt ttg aag ctg ata aga     2052
Thr Val Leu Val Asn Ser Pro Arg Asp Ala Val Leu Lys Leu Ile Arg
        610                 615                 620

aaa ata aac ccg aat gtc ttc att cca gcg atc tta agc ggg aat tac     2100
Lys Ile Asn Pro Asn Val Phe Ile Pro Ala Ile Leu Ser Gly Asn Tyr
    625                 630                 635

aac gcg cca ttc ttt gtc acg agg ttc aga gaa gcg ttg ttt cat tac     2148
Asn Ala Pro Phe Phe Val Thr Arg Phe Arg Glu Ala Leu Phe His Tyr
640                 645                 650                 655

tcg gct gtg ttt gat atg tgt gac tcg aag cta gct agg gaa gac gag     2196
Ser Ala Val Phe Asp Met Cys Asp Ser Lys Leu Ala Arg Glu Asp Glu
                660                 665                 670

atg agg ctg atg tat gag aaa gag ttt tat ggg aga gag att gtg aat     2244
Met Arg Leu Met Tyr Glu Lys Glu Phe Tyr Gly Arg Glu Ile Val Asn
            675                 680                 685

gtt gtg gct tgt gaa gga aca gag aga gtg gag aga cca gag aca tat     2292
Val Val Ala Cys Glu Gly Thr Glu Arg Val Glu Arg Pro Glu Thr Tyr
        690                 695                 700

aag cag tgg cag gcg aga ctg atc cga gcc gga ttt aga cag ctt ccg     2340
Lys Gln Trp Gln Ala Arg Leu Ile Arg Ala Gly Phe Arg Gln Leu Pro
    705                 710                 715
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ctt gag aag gaa ctg atg cag aat ctg aag ttg aaa atc gaa aac ggg 2388
Leu Glu Lys Glu Leu Met Gln Asn Leu Lys Leu Lys Ile Glu Asn Gly
720 725 730 735

tac gat aaa aac ttc gat gtt gat caa aac ggt aac tgg tta ctt caa 2436
Tyr Asp Lys Asn Phe Asp Val Asp Gln Asn Gly Asn Trp Leu Leu Gln
740 745 750

ggg tgg aaa ggt aga atc gtg tat gct tca tct cta tgg gtt cct tcg 2484
Gly Trp Lys Gly Arg Ile Val Tyr Ala Ser Ser Leu Trp Val Pro Ser
755 760 765

tct tca tag atgttgtttc ttacgttcta agcgactggg atttatgtag 2533
Ser Ser

ggcttttctg ttgatagtct ctcgccaaca cgagtggatt aagttcagag ttagggttct 2593

tgaacactag aatgttgtta tattatgctt gtgacatagc gtgtgtaaga gtgtagccta 2653

agagatatag tactcattgc atgatctttt gctatatgtt 2693

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Met Gly Ser Tyr Pro Asp Gly Phe Pro Gly Ser Met Asp Glu Leu Asp
1 5 10 15

Phe Asn Lys Asp Phe Asp Leu Pro Pro Ser Ser Asn Gln Thr Leu Gly
20 25 30

Leu Ala Asn Gly Phe Tyr Leu Asp Asp Leu Asp Phe Ser Ser Leu Asp
35 40 45

Pro Pro Glu Ala Tyr Pro Ser Gln Asn Asn Asn Asn Asn Asn Ile Asn
50 55 60

Asn Lys Ala Val Ala Gly Asp Leu Leu Ser Ser Ser Ser Asp Asp Ala
65 70 75 80

Asp Phe Ser Asp Ser Val Leu Lys Tyr Ile Ser Gln Val Leu Met Glu
85 90 95

Glu Asp Met Glu Glu Lys Pro Cys Met Phe His Asp Ala Leu Ala Leu
100 105 110

Gln Ala Ala Glu Lys Ser Leu Tyr Glu Ala Leu Gly Glu Lys Tyr Pro
115 120 125

Ser Ser Ser Ser Ala Ser Ser Val Asp His Pro Glu Arg Leu Ala Ser
130 135 140

Asp Ser Pro Asp Gly Ser Cys Ser Gly Gly Ala Phe Ser Asp Tyr Ala
145 150 155 160

Ser Thr Thr Thr Thr Thr Ser Ser Asp Ser His Trp Ser Val Asp Gly
165 170 175

Leu Glu Asn Arg Pro Ser Trp Leu His Thr Pro Met Pro Ser Asn Phe
180 185 190

Val Phe Gln Ser Thr Ser Arg Ser Asn Ser Val Thr Gly Gly Gly Gly
195 200 205

Gly Gly Asn Ser Ala Val Tyr Gly Ser Gly Phe Gly Asp Asp Leu Val
210 215 220

Ser Asn Met Phe Lys Asp Asp Glu Leu Ala Met Gln Phe Lys Lys Gly
225 230 235 240

Val Glu Glu Ala Ser Lys Phe Leu Pro Lys Ser Ser Gln Leu Phe Ile
245 250 255

Asp Val Asp Ser Tyr Ile Pro Met Asn Ser Gly Ser Lys Glu Asn Gly
260 265 270

Ser Glu Val Phe Val Lys Thr Glu Lys Lys Asp Glu Thr Glu His His
275 280 285

His His His Ser Tyr Ala Pro Pro Pro Asn Arg Leu Thr Gly Lys Lys
290 295 300

Ser His Trp Arg Asp Glu Asp Glu Asp Phe Val Glu Glu Arg Ser Asn
305 310 315 320

Lys Gln Ser Ala Val Tyr Val Glu Glu Ser Glu Leu Ser Glu Met Phe
325 330 335

Asp Lys Ile Leu Val Cys Gly Pro Gly Lys Pro Val Cys Ile Leu Asn
340 345 350

Gln Asn Phe Pro Thr Glu Ser Ala Lys Val Val Thr Ala Gln Ser Asn

355 360 365

Gly Ala Lys Ile Arg Gly Lys Lys Ser Thr Ser Thr Ser His Ser Asn
370 375 380

Asp Ser Lys Lys Glu Thr Ala Asp Leu Arg Thr Leu Leu Val Leu Cys
385 390 395 400

Ala Gln Ala Val Ser Val Asp Asp Arg Arg Thr Ala Asn Glu Met Leu
405 410 415

Arg Gln Ile Arg Glu His Ser Ser Pro Leu Gly Asn Gly Ser Glu Arg
420 425 430

Leu Ala His Tyr Phe Ala Asn Ser Leu Glu Ala Arg Leu Ala Gly Thr
435 440 445

Gly Thr Gln Ile Tyr Thr Ala Leu Ser Ser Lys Lys Thr Ser Ala Ala
450 455 460

Asp Met Leu Lys Ala Tyr Gln Thr Tyr Met Ser Val Cys Pro Phe Lys
465 470 475 480

Lys Ala Ala Ile Ile Phe Ala Asn His Ser Met Met Arg Phe Thr Ala
485 490 495

Asn Ala Asn Thr Ile His Ile Ile Asp Phe Gly Ile Ser Tyr Gly Phe
500 505 510

Gln Trp Pro Ala Leu Ile His Arg Leu Ser Leu Ser Arg Pro Gly Gly
515 520 525

Ser Pro Lys Leu Arg Ile Thr Gly Ile Glu Leu Pro Gln Arg Gly Phe
530 535 540

Arg Pro Ala Glu Glu Phe Arg Arg Gln Val Ile Ala Trp Leu Asp Thr
545 550 555 560

Val Ser Asp Thr Met Phe Arg Leu Ser Thr Thr Gln Leu Leu Arg Asn
565 570 575

Gly Glu Thr Ile Gln Val Glu Asp Leu Lys Leu Arg Gln Gly Glu Tyr
580 585 590

Val Val Val Asn Ser Leu Phe Arg Phe Arg Asn Leu Leu Asp Glu Thr
595 600 605

Val Leu Val Asn Ser Pro Arg Asp Ala Val Leu Lys Leu Ile Arg Lys
610 615 620

Ile Asn Pro Asn Val Phe Ile Pro Ala Ile Leu Ser Gly Asn Tyr Asn
625 630 635 640

Ala Pro Phe Phe Val Thr Arg Phe Arg Glu Ala Leu Phe His Tyr Ser
645 650 655

Ala Val Phe Asp Met Cys Asp Ser Lys Leu Ala Arg Glu Asp Glu Met
660 665 670

Arg Leu Met Tyr Glu Lys Glu Phe Tyr Gly Arg Glu Ile Val Asn Val
675 680 685

Val Ala Cys Glu Gly Thr Glu Arg Val Glu Arg Pro Glu Thr Tyr Lys
690 695 700

Gln Trp Gln Ala Arg Leu Ile Arg Ala Gly Phe Arg Gln Leu Pro Leu
705 710 715 720

Glu Lys Glu Leu Met Gln Asn Leu Lys Leu Lys Ile Glu Asn Gly Tyr
725 730 735

Asp Lys Asn Phe Asp Val Asp Gln Asn Gly Asn Trp Leu Leu Gln Gly
740 745 750

Trp Lys Gly Arg Ile Val Tyr Ala Ser Ser Leu Trp Val Pro Ser Ser
755 760 765

Ser

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Met Leu Ser Asn Lys Asn Thr Asn Thr Cys Cys Val Val Ser Ser Ser
1 5 10 15

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tct tct gat cct ttc ctc tcc tct tca gaa aat ggg gtc acc acc aca        96
Ser Ser Asp Pro Phe Leu Ser Ser Ser Glu Asn Gly Val Thr Thr Thr
            20                  25                  30

aac aca tcc act cag aag agg aaa aga aga cct gca ggt acc cca gat       144
Asn Thr Ser Thr Gln Lys Arg Lys Arg Arg Pro Ala Gly Thr Pro Asp
        35                  40                  45

cca gat gca gaa gtt gtg tct tta tca cca aga act ctt ctt gaa tca       192
Pro Asp Ala Glu Val Val Ser Leu Ser Pro Arg Thr Leu Leu Glu Ser
    50                  55                  60

gac aga tac ata tgt gag atc tgt aac caa ggg ttt caa aga gac cag       240
Asp Arg Tyr Ile Cys Glu Ile Cys Asn Gln Gly Phe Gln Arg Asp Gln
65                  70                  75                  80

aat ctc cag atg cat aga aga cgt cac aaa gtt cca tgg aag ctt ctt       288
Asn Leu Gln Met His Arg Arg Arg His Lys Val Pro Trp Lys Leu Leu
                85                  90                  95

aaa aga gac aac aac ata gag gtg aag aaa cga gtc tat gtt tgc cct       336
Lys Arg Asp Asn Asn Ile Glu Val Lys Lys Arg Val Tyr Val Cys Pro
            100                 105                 110

gaa ccc act tgc ctt cac cat aat cct tgt cat gct ctg gga gat ctt       384
Glu Pro Thr Cys Leu His His Asn Pro Cys His Ala Leu Gly Asp Leu
        115                 120                 125

gtc ggc atc aaa aaa cat ttc aga aga aaa cat agt aac cat aag caa       432
Val Gly Ile Lys Lys His Phe Arg Arg Lys His Ser Asn His Lys Gln
    130                 135                 140

tgg gtt tgt gag aga tgc tct aaa ggt tat gct gtt caa tct gat tac       480
Trp Val Cys Glu Arg Cys Ser Lys Gly Tyr Ala Val Gln Ser Asp Tyr
145                 150                 155                 160

aaa gct cat ctc aaa act tgt ggt act aga gga cat tct tgt gac tgt       528
Lys Ala His Leu Lys Thr Cys Gly Thr Arg Gly His Ser Cys Asp Cys
                165                 170                 175

ggt cgt gtc ttc tcc agg gtg gag agt ttt att gaa cat caa gat aat       576
Gly Arg Val Phe Ser Arg Val Glu Ser Phe Ile Glu His Gln Asp Asn
            180                 185                 190

tgt tcc gca cgg aga gtt cac cgt gaa ccg cct cga cca cca caa acc       624
Cys Ser Ala Arg Arg Val His Arg Glu Pro Pro Arg Pro Pro Gln Thr
        195                 200                 205

gcg gta aca gtc ccg gca tgc tct tct aga acc gcc tca acc gtc agc       672
Ala Val Thr Val Pro Ala Cys Ser Ser Arg Thr Ala Ser Thr Val Ser
    210                 215                 220

act ccg tct agt gaa acc aat tac ggc ggt aca gtt gcg gtt acg act       720
Thr Pro Ser Ser Glu Thr Asn Tyr Gly Gly Thr Val Ala Val Thr Thr
225                 230                 235                 240
```

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cct caa cct cta gaa ggc cgt cca att cat cag aga atc tca tct tca      768
Pro Gln Pro Leu Glu Gly Arg Pro Ile His Gln Arg Ile Ser Ser Ser
                245                 250                 255

att ctc acc aac tca tca aac aat ctc aac ctc gaa ctc caa ctt ctt      816
Ile Leu Thr Asn Ser Ser Asn Asn Leu Asn Leu Glu Leu Gln Leu Leu
            260                 265                 270

cca tta tcg tcg aat caa aac cct aat caa gaa aac caa caa caa aaa      864
Pro Leu Ser Ser Asn Gln Asn Pro Asn Gln Glu Asn Gln Gln Gln Lys
        275                 280                 285

gtt aaa gaa cca tct cat cat cat aat cat aat cat gat acc aca aac      912
Val Lys Glu Pro Ser His His His Asn His Asn His Asp Thr Thr Asn
    290                 295                 300

tta aac ctc tcc att gca cca tca tca tca tat caa cat tac aac aac      960
Leu Asn Leu Ser Ile Ala Pro Ser Ser Ser Tyr Gln His Tyr Asn Asn
305                 310                 315                 320

ttt gat cgt ata aaa gag att atg gcg agc gag caa att atg aag ata     1008
Phe Asp Arg Ile Lys Glu Ile Met Ala Ser Glu Gln Ile Met Lys Ile
                325                 330                 335

gcg atg aag gag aaa gct tac gct gag gaa gct aaa aga gaa gcc aag     1056
Ala Met Lys Glu Lys Ala Tyr Ala Glu Glu Ala Lys Arg Glu Ala Lys
            340                 345                 350

agg caa cga gag ata gcg gaa aac gag ttt gca aat gcc aaa aag att     1104
Arg Gln Arg Glu Ile Ala Glu Asn Glu Phe Ala Asn Ala Lys Lys Ile
        355                 360                 365

agg caa aaa gca caa gct gaa ctc gag aga gct aag ttt tta aag gaa     1152
Arg Gln Lys Ala Gln Ala Glu Leu Glu Arg Ala Lys Phe Leu Lys Glu
    370                 375                 380

caa tct atg aag aag ata agt tca acg atc atg cag gtc act tgt caa     1200
Gln Ser Met Lys Lys Ile Ser Ser Thr Ile Met Gln Val Thr Cys Gln
385                 390                 395                 400

aca tgt aaa gga cag ttt caa gca gtt gcg gtt ccg gcg gct acg gct     1248
Thr Cys Lys Gly Gln Phe Gln Ala Val Ala Val Pro Ala Ala Thr Ala
                405                 410                 415

gat gag acg tct ctt gtc gtg agt tac atg tcg tca gcg aat act gac     1296
Asp Glu Thr Ser Leu Val Val Ser Tyr Met Ser Ser Ala Asn Thr Asp
            420                 425                 430

gga gag ttg gaa aat ggt ttt taa                                    1320
Gly Glu Leu Glu Asn Gly Phe
        435
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Met Leu Ser Asn Lys Asn Thr Asn Thr Cys Cys Val Val Ser Ser Ser
1               5                   10                  15
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Ser Ser Asp Pro Phe Leu Ser Ser Ser Glu Asn Gly Val Thr Thr Thr
20 25 30

Asn Thr Ser Thr Gln Lys Arg Lys Arg Arg Pro Ala Gly Thr Pro Asp
35 40 45

Pro Asp Ala Glu Val Val Ser Leu Ser Pro Arg Thr Leu Leu Glu Ser
50 55 60

Asp Arg Tyr Ile Cys Glu Ile Cys Asn Gln Gly Phe Gln Arg Asp Gln
65 70 75 80

Asn Leu Gln Met His Arg Arg Arg His Lys Val Pro Trp Lys Leu Leu
85 90 95

Lys Arg Asp Asn Asn Ile Glu Val Lys Lys Arg Val Tyr Val Cys Pro
100 105 110

Glu Pro Thr Cys Leu His His Asn Pro Cys His Ala Leu Gly Asp Leu
115 120 125

Val Gly Ile Lys Lys His Phe Arg Arg Lys His Ser Asn His Lys Gln
130 135 140

Trp Val Cys Glu Arg Cys Ser Lys Gly Tyr Ala Val Gln Ser Asp Tyr
145 150 155 160

Lys Ala His Leu Lys Thr Cys Gly Thr Arg Gly His Ser Cys Asp Cys
165 170 175

Gly Arg Val Phe Ser Arg Val Glu Ser Phe Ile Glu His Gln Asp Asn
180 185 190

Cys Ser Ala Arg Arg Val His Arg Glu Pro Pro Arg Pro Pro Gln Thr
195 200 205

Ala Val Thr Val Pro Ala Cys Ser Ser Arg Thr Ala Ser Thr Val Ser
210 215 220

Thr Pro Ser Ser Glu Thr Asn Tyr Gly Gly Thr Val Ala Val Thr Thr
225 230 235 240

Pro Gln Pro Leu Glu Gly Arg Pro Ile His Gln Arg Ile Ser Ser Ser
245 250 255

Ile Leu Thr Asn Ser Ser Asn Asn Leu Asn Leu Glu Leu Gln Leu Leu
260 265 270

Pro Leu Ser Ser Asn Gln Asn Pro Asn Gln Glu Asn Gln Gln Gln Lys
275 280 285

Val Lys Glu Pro Ser His His His Asn His Asn His Asp Thr Thr Asn
290 295 300

Leu Asn Leu Ser Ile Ala Pro Ser Ser Ser Tyr Gln His Tyr Asn Asn
305 310 315 320

Phe Asp Arg Ile Lys Glu Ile Met Ala Ser Glu Gln Ile Met Lys Ile
325 330 335

Ala Met Lys Glu Lys Ala Tyr Ala Glu Glu Ala Lys Arg Glu Ala Lys
340 345 350

Arg Gln Arg Glu Ile Ala Glu Asn Glu Phe Ala Asn Ala Lys Lys Ile
355 360 365

Arg Gln Lys Ala Gln Ala Glu Leu Glu Arg Ala Lys Phe Leu Lys Glu
370 375 380

Gln Ser Met Lys Lys Ile Ser Ser Thr Ile Met Gln Val Thr Cys Gln
385 390 395 400

Thr Cys Lys Gly Gln Phe Gln Ala Val Ala Val Pro Ala Ala Thr Ala
405 410 415

Asp Glu Thr Ser Leu Val Val Ser Tyr Met Ser Ser Ala Asn Thr Asp
420 425 430

Gly Glu Leu Glu Asn Gly Phe
435

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gagaacaaga agagtccagg gccaatgagc ctgagggtat caaatcagtg attgatgaca     120

tctacatttt tgaagacgac cctgtggttg ataggttcaa taggtttggc acggag atg      179
                                                                 Met
                                                                  1

tct gcc atg gtc tcg gcc ttg aca cag gtg gtt tct gct cgc tct cag        227
Ser Ala Met Val Ser Ala Leu Thr Gln Val Val Ser Ala Arg Ser Gln
            5                  10                  15

act gag gct gaa ggt gct cac tct cag act gag gct gaa ggt gct cac        275
Thr Glu Ala Glu Gly Ala His Ser Gln Thr Glu Ala Glu Gly Ala His
        20                  25                  30

tct tct tcc tct tcg gct gga cat aaa aga gga tgg ctt gga atc gat        323
Ser Ser Ser Ser Ser Ala Gly His Lys Arg Gly Trp Leu Gly Ile Asp
    35                  40                  45

tct gct cct att ccc tca tca ttt gct cgt gta gac tct tca cat aat        371
Ser Ala Pro Ile Pro Ser Ser Phe Ala Arg Val Asp Ser Ser His Asn
50                  55                  60                  65

ccg atc gaa gaa tcc atg agc aag gca ttt cca gag gaa gca agg gag        419
Pro Ile Glu Glu Ser Met Ser Lys Ala Phe Pro Glu Glu Ala Arg Glu
                70                  75                  80

aaa aaa agg agg tac aga gga gta agg cag aga cca tgg ggc aaa tgg        467
Lys Lys Arg Arg Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys Trp
            85                  90                  95

gca gct gag ata cgt gat cca cat aga gcc gct agg gtt tgg ctc ggg        515
Ala Ala Glu Ile Arg Asp Pro His Arg Ala Ala Arg Val Trp Leu Gly
        100                 105                 110

acg ttt gat aca gcg gag gcc gcg gct aga gcc tac gac gag gct gca        563
Thr Phe Asp Thr Ala Glu Ala Ala Ala Arg Ala Tyr Asp Glu Ala Ala
    115                 120                 125

ctc cgg ttc cgt gga aat aaa gca aag cta aat ttc cca gag gat gta        611
Leu Arg Phe Arg Gly Asn Lys Ala Lys Leu Asn Phe Pro Glu Asp Val
130                 135                 140                 145

agg att ctt cct cct ccc cct cct ctt ctt cgt tca cca gct gac acg        659
Arg Ile Leu Pro Pro Pro Pro Pro Leu Leu Arg Ser Pro Ala Asp Thr
                150                 155                 160

gtg gcg aat aaa gca gaa gag gat ctg ata aat tat tgg agt tat aca        707
Val Ala Asn Lys Ala Glu Glu Asp Leu Ile Asn Tyr Trp Ser Tyr Thr
            165                 170                 175

aag ttg ttg caa agt tca ggc caa cgg tca ttt ctc gag cga gga caa        755
Lys Leu Leu Gln Ser Ser Gly Gln Arg Ser Phe Leu Glu Arg Gly Gln
        180                 185                 190

gaa gag agt agt aac ata ttt gaa cat tca cca atg gaa caa cct ctg        803
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Glu Glu Ser Ser Asn Ile Phe Glu His Ser Pro Met Glu Gln Pro Leu
195 200 205

cct cct tca agt tct ggt cca agt tcc tct aat ttt cct gca cct tct 851
Pro Pro Ser Ser Ser Gly Pro Ser Ser Ser Asn Phe Pro Ala Pro Ser
210 215 220 225

cta cct aat aca tag tttcactttt attaaagctc tacaaataca attaaataca 906
Leu Pro Asn Thr

tagctaaatg aaaatgattt tcttgtctgt ataccttctt aagtgctaaa caatatattg 966

tactctttgt tttccttaac taaaaaaaaa aaaaaaaaaa aaa 1009

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Met Ser Ala Met Val Ser Ala Leu Thr Gln Val Val Ser Ala Arg Ser
1 5 10 15

Gln Thr Glu Ala Glu Gly Ala His Ser Gln Thr Glu Ala Glu Gly Ala
20 25 30

His Ser Ser Ser Ser Ser Ala Gly His Lys Arg Gly Trp Leu Gly Ile
35 40 45

Asp Ser Ala Pro Ile Pro Ser Ser Phe Ala Arg Val Asp Ser Ser His
50 55 60

Asn Pro Ile Glu Glu Ser Met Ser Lys Ala Phe Pro Glu Glu Ala Arg
65 70 75 80

Glu Lys Lys Arg Arg Tyr Arg Gly Val Arg Gln Arg Pro Trp Gly Lys
85 90 95

Trp Ala Ala Glu Ile Arg Asp Pro His Arg Ala Ala Arg Val Trp Leu
100 105 110

Gly Thr Phe Asp Thr Ala Glu Ala Ala Ala Arg Ala Tyr Asp Glu Ala
115 120 125

Ala Leu Arg Phe Arg Gly Asn Lys Ala Lys Leu Asn Phe Pro Glu Asp
130 135 140

Val Arg Ile Leu Pro Pro Pro Pro Pro Leu Leu Arg Ser Pro Ala Asp
145 150 155 160

Thr Val Ala Asn Lys Ala Glu Glu Asp Leu Ile Asn Tyr Trp Ser Tyr
165 170 175

Thr Lys Leu Leu Gln Ser Ser Gly Gln Arg Ser Phe Leu Glu Arg Gly
180 185 190

Gln Glu Glu Ser Ser Asn Ile Phe Glu His Ser Pro Met Glu Gln Pro
195 200 205

Leu Pro Pro Ser Ser Ser Gly Pro Ser Ser Ser Asn Phe Pro Ala Pro
210 215 220

Ser Leu Pro Asn Thr
225

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<400> 509

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Met Gly Arg Gln Pro Cys Cys Asp Lys Leu Met Val Lys Lys Gly Pro
1 5 10 15

tgg acg gcg gag gaa gac aag aaa ctg ata aac ttt atc ttg acc aac 96
Trp Thr Ala Glu Glu Asp Lys Lys Leu Ile Asn Phe Ile Leu Thr Asn
20 25 30

ggc cac tgt tgc tgg agg gct ttg ccg aag ctg gcc ggt ctc cgt cgc 144
Gly His Cys Cys Trp Arg Ala Leu Pro Lys Leu Ala Gly Leu Arg Arg
35 40 45

tgt ggg aag agc tgc cgt cta cgg tgg acc aat tat ctc cga cct gac 192
Cys Gly Lys Ser Cys Arg Leu Arg Trp Thr Asn Tyr Leu Arg Pro Asp
50 55 60

ttg aag aga ggt ctt ctc tcc gac gcc gag gaa cag ctt gtc atc gac 240
Leu Lys Arg Gly Leu Leu Ser Asp Ala Glu Glu Gln Leu Val Ile Asp
65 70 75 80

ctt cat gct ctt ctc ggc aac aga tgg tcc aag atc gct gca aga tta 288
Leu His Ala Leu Leu Gly Asn Arg Trp Ser Lys Ile Ala Ala Arg Leu
85 90 95

cca gga aga aca gac aac gaa ata aaa aat cat tgg aat act cat atc 336
Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn His Trp Asn Thr His Ile
100 105 110

aag aag aag ctc ctt aag atg gaa atc gat cct tcg acc cat caa cct 384
Lys Lys Lys Leu Leu Lys Met Glu Ile Asp Pro Ser Thr His Gln Pro
115 120 125

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tta aac aaa gta ttt acc gat aca aac tta gtc gat aaa tct gaa act      432
Leu Asn Lys Val Phe Thr Asp Thr Asn Leu Val Asp Lys Ser Glu Thr
    130                 135                 140

tca tcg aaa gcc gac aat gta aat gat aat aaa atc gta gag atc gat      480
Ser Ser Lys Ala Asp Asn Val Asn Asp Asn Lys Ile Val Glu Ile Asp
145                 150                 155                 160

ggg aca acg aca aat aca ata gat gat agc att atc act cat caa aat      528
Gly Thr Thr Thr Asn Thr Ile Asp Asp Ser Ile Ile Thr His Gln Asn
                165                 170                 175

agt tca aat gat gat tat gaa tta ctt ggt gat ata att cat aat tat      576
Ser Ser Asn Asp Asp Tyr Glu Leu Leu Gly Asp Ile Ile His Asn Tyr
            180                 185                 190

gga gat tta ttt aat att cta tgg acc aac gat gaa cct cct cta gtc      624
Gly Asp Leu Phe Asn Ile Leu Trp Thr Asn Asp Glu Pro Pro Leu Val
        195                 200                 205

gat gat gca tca tgg agc aat cat aac gtt ggt att gga gga aca gct      672
Asp Asp Ala Ser Trp Ser Asn His Asn Val Gly Ile Gly Gly Thr Ala
    210                 215                 220

gca gtt gca gcc tca gac aag aac aac act gct gcc gag gaa gat ttc      720
Ala Val Ala Ala Ser Asp Lys Asn Asn Thr Ala Ala Glu Glu Asp Phe
225                 230                 235                 240

ccg gaa aga tca ttt gaa aaa cag aac ggc gaa agt tgg atg ttc ttg      768
Pro Glu Arg Ser Phe Glu Lys Gln Asn Gly Glu Ser Trp Met Phe Leu
                245                 250                 255

gat tat tgc caa gaa ttt ggt gtt gaa gat ttt ggg ttc gag tgt tac      816
Asp Tyr Cys Gln Glu Phe Gly Val Glu Asp Phe Gly Phe Glu Cys Tyr
            260                 265                 270

cat ggt ttt ggt caa agc tcc atg aag acg ggt cac aag gac tag          861
His Gly Phe Gly Gln Ser Ser Met Lys Thr Gly His Lys Asp
        275                 280                 285
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Met Gly Arg Gln Pro Cys Cys Asp Lys Leu Met Val Lys Lys Gly Pro
1               5                   10                  15

Trp Thr Ala Glu Glu Asp Lys Lys Leu Ile Asn Phe Ile Leu Thr Asn
            20                  25                  30

Gly His Cys Cys Trp Arg Ala Leu Pro Lys Leu Ala Gly Leu Arg Arg
        35                  40                  45

Cys Gly Lys Ser Cys Arg Leu Arg Trp Thr Asn Tyr Leu Arg Pro Asp
    50                  55                  60
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Leu Lys Arg Gly Leu Leu Ser Asp Ala Glu Glu Gln Leu Val Ile Asp
65 70 75 80

Leu His Ala Leu Leu Gly Asn Arg Trp Ser Lys Ile Ala Ala Arg Leu
85 90 95

Pro Gly Arg Thr Asp Asn Glu Ile Lys Asn His Trp Asn Thr His Ile
100 105 110

Lys Lys Lys Leu Leu Lys Met Glu Ile Asp Pro Ser Thr His Gln Pro
115 120 125

Leu Asn Lys Val Phe Thr Asp Thr Asn Leu Val Asp Lys Ser Glu Thr
130 135 140

Ser Ser Lys Ala Asp Asn Val Asn Asp Asn Lys Ile Val Glu Ile Asp
145 150 155 160

Gly Thr Thr Thr Asn Thr Ile Asp Asp Ser Ile Ile Thr His Gln Asn
165 170 175

Ser Ser Asn Asp Asp Tyr Glu Leu Leu Gly Asp Ile Ile His Asn Tyr
180 185 190

Gly Asp Leu Phe Asn Ile Leu Trp Thr Asn Asp Glu Pro Pro Leu Val
195 200 205

Asp Asp Ala Ser Trp Ser Asn His Asn Val Gly Ile Gly Gly Thr Ala
210 215 220

Ala Val Ala Ala Ser Asp Lys Asn Asn Thr Ala Ala Glu Glu Asp Phe
225 230 235 240

Pro Glu Arg Ser Phe Glu Lys Gln Asn Gly Glu Ser Trp Met Phe Leu
245 250 255

Asp Tyr Cys Gln Glu Phe Gly Val Glu Asp Phe Gly Phe Glu Cys Tyr
260 265 270

His Gly Phe Gly Gln Ser Ser Met Lys Thr Gly His Lys Asp
275 280 285

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tcgattctga ttttttttca aggtcaattt tttcttctct ttaaactctg caaaatcgtg    180

atcgattaaa ttcacctcag ggtttttga tttctgaaag aagttaatct tcttcgaagg    240

cgattgcaaa agagtgctct gctgtgaatt tccactgag atg caa tca aaa ccg       294
                                          Met Gln Ser Lys Pro
                                          1               5

gga aga gaa aac gaa gag gaa gtc aat aat cac cat gct gtt cag cag       342
Gly Arg Glu Asn Glu Glu Glu Val Asn Asn His His Ala Val Gln Gln
                10                  15                  20

ccg atg atg tat gca gag ccc tgg tgg aaa aac aac tcc ttt ggt gtt       390
Pro Met Met Tyr Ala Glu Pro Trp Trp Lys Asn Asn Ser Phe Gly Val
            25                  30                  35

gta cct caa gcg aga cct tct gga att cca tca aat tcc tct tct ttg       438
Val Pro Gln Ala Arg Pro Ser Gly Ile Pro Ser Asn Ser Ser Ser Leu
        40                  45                  50

gat tgc ccc aat ggt tcc gag tca aac gat gtt cat tca gca tct gaa       486
Asp Cys Pro Asn Gly Ser Glu Ser Asn Asp Val His Ser Ala Ser Glu
    55                  60                  65

gac ggt gcg ttg aat ggt gaa aac gat ggc act tgg aag gat tca caa       534
Asp Gly Ala Leu Asn Gly Glu Asn Asp Gly Thr Trp Lys Asp Ser Gln
70                  75                  80                  85

gct gca act tcc tct cgt tca gat aat cac gga atg gaa gga aat gac       582
Ala Ala Thr Ser Ser Arg Ser Asp Asn His Gly Met Glu Gly Asn Asp
                90                  95                  100

cca gcg ctc tct atc cgt aac atg cat gat cag cca ctt gta caa cca       630
Pro Ala Leu Ser Ile Arg Asn Met His Asp Gln Pro Leu Val Gln Pro
            105                 110                 115

cca gag ctt gtt gga cac tat atc gct tgt gtc cca aac cca tat cag       678
Pro Glu Leu Val Gly His Tyr Ile Ala Cys Val Pro Asn Pro Tyr Gln
        120                 125                 130

gat cca tat tat ggg gga ttg atg gga gca tat ggt cat cag caa ttg       726
Asp Pro Tyr Tyr Gly Gly Leu Met Gly Ala Tyr Gly His Gln Gln Leu
    135                 140                 145

ggt ttt cgt cca tat ctt gga atg cct cgt gaa aga aca gct ctg cca       774
Gly Phe Arg Pro Tyr Leu Gly Met Pro Arg Glu Arg Thr Ala Leu Pro
150                 155                 160                 165
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ctt gac atg gca caa gag ccc gtt tat gtg aat gca aag cag tac gag      822
Leu Asp Met Ala Gln Glu Pro Val Tyr Val Asn Ala Lys Gln Tyr Glu
                170                 175                 180

gga att cta agg cga aga aaa gca cgt gcc aag gca gag cta gag agg      870
Gly Ile Leu Arg Arg Arg Lys Ala Arg Ala Lys Ala Glu Leu Glu Arg
            185                 190                 195

aaa gtc atc cgg gac aga aag cca tat ctt cac gag tca aga cac aag      918
Lys Val Ile Arg Asp Arg Lys Pro Tyr Leu His Glu Ser Arg His Lys
        200                 205                 210

cat gca atg aga agg gca cga gcg agt gga ggc cgg ttt gcg aag aaa      966
His Ala Met Arg Arg Ala Arg Ala Ser Gly Gly Arg Phe Ala Lys Lys
    215                 220                 225

agt gag gta gaa gcg gga gag gat gca gga ggg aga gac aga gaa agg     1014
Ser Glu Val Glu Ala Gly Glu Asp Ala Gly Gly Arg Asp Arg Glu Arg
230                 235                 240                 245

ggt tca gca acc aac tca tca ggc tct gaa caa gtt gag aca gac tct     1062
Gly Ser Ala Thr Asn Ser Ser Gly Ser Glu Gln Val Glu Thr Asp Ser
                250                 255                 260

aat gag acc ctg aat tct tct ggt gca cca taa taaaaaaagc caaagctctg   1115
Asn Glu Thr Leu Asn Ser Ser Gly Ala Pro
            265                 270

agaggagaga gagacacaca ctttggctaa tataatccat tgcctcaaac cggcaaatca   1175

ttcttggctt tttcgttttt gtgtttgcta gttgttcttg tcagagtctc atattgtgtg   1235

ggtttaacag ttatgatgaa tgtacaaaga gcgagttatg ttaggtgtta gattttggag   1295

acaagagaca aaggaatagc aagtaggtct tgtttttatt ctttgacctt ttttttctct   1355

tttgcaaaat tgaaaaatac gtttgcttaa aaa                                1388
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Met Gln Ser Lys Pro Gly Arg Glu Asn Glu Glu Glu Val Asn Asn His
1               5                   10                  15

His Ala Val Gln Gln Pro Met Met Tyr Ala Glu Pro Trp Trp Lys Asn
            20                  25                  30

Asn Ser Phe Gly Val Val Pro Gln Ala Arg Pro Ser Gly Ile Pro Ser
        35                  40                  45

Asn Ser Ser Ser Leu Asp Cys Pro Asn Gly Ser Glu Ser Asn Asp Val
    50                  55                  60
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Replacement Sheet

His Ser Ala Ser Glu Asp Gly Ala Leu Asn Gly Glu Asn Asp Gly Thr
65 70 75 80

Trp Lys Asp Ser Gln Ala Ala Thr Ser Ser Arg Ser Asp Asn His Gly
85 90 95

Met Glu Gly Asn Asp Pro Ala Leu Ser Ile Arg Asn Met His Asp Gln
100 105 110

Pro Leu Val Gln Pro Pro Glu Leu Val Gly His Tyr Ile Ala Cys Val
115 120 125

Pro Asn Pro Tyr Gln Asp Pro Tyr Tyr Gly Gly Leu Met Gly Ala Tyr
130 135 140

Gly His Gln Gln Leu Gly Phe Arg Pro Tyr Leu Gly Met Pro Arg Glu
145 150 155 160

Arg Thr Ala Leu Pro Leu Asp Met Ala Gln Glu Pro Val Tyr Val Asn
165 170 175

Ala Lys Gln Tyr Glu Gly Ile Leu Arg Arg Arg Lys Ala Arg Ala Lys
180 185 190

Ala Glu Leu Glu Arg Lys Val Ile Arg Asp Arg Lys Pro Tyr Leu His
195 200 205

Glu Ser Arg His Lys His Ala Met Arg Arg Ala Arg Ala Ser Gly Gly
210 215 220

Arg Phe Ala Lys Lys Ser Glu Val Glu Ala Gly Glu Asp Ala Gly Gly
225 230 235 240

Arg Asp Arg Glu Arg Gly Ser Ala Thr Asn Ser Ser Gly Ser Glu Gln
245 250 255

Val Glu Thr Asp Ser Asn Glu Thr Leu Asn Ser Ser Gly Ala Pro
260 265 270

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<222> (108)..(722) <223> G280

<400> 513
aagttaatat gagaataatg agaaaaccac tttcccaaat tgctttttaa aatccctcct 60

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cacacagatt ccttccttca tcacctcaca cactctctac gcttgac atg gcc ttc      116
                                                      Met Ala Phe
                                                      1

gat ctc cac cat ggc tca gct tca gat acg cat tca tca gaa ctt ccg      164
Asp Leu His His Gly Ser Ala Ser Asp Thr His Ser Ser Glu Leu Pro
    5                   10                  15

tcg ttt tct ctc cca cct tat cct cag atg ata atg gaa gcg att gag      212
Ser Phe Ser Leu Pro Pro Tyr Pro Gln Met Ile Met Glu Ala Ile Glu
20                  25                  30                  35

tcc ttg aac gat aag aac ggc tgc aac aaa acg acg att gct aag cac      260
Ser Leu Asn Asp Lys Asn Gly Cys Asn Lys Thr Thr Ile Ala Lys His
                40                  45                  50

atc gag tcg act caa caa act cta ccg ccg tca cac atg acg ctg ctc      308
Ile Glu Ser Thr Gln Gln Thr Leu Pro Pro Ser His Met Thr Leu Leu
            55                  60                  65

agc tac cat ctc aac cag atg aag aaa acc ggt cag cta atc atg gtg      356
Ser Tyr His Leu Asn Gln Met Lys Lys Thr Gly Gln Leu Ile Met Val
        70                  75                  80

aag aac aat tat atg aaa cca gat cca gat gct cct cct aag cgt ggt      404
Lys Asn Asn Tyr Met Lys Pro Asp Pro Asp Ala Pro Pro Lys Arg Gly
    85                  90                  95

cgt ggc cgt cct ccg aag cag aag act cag gcc gaa tct gac gcc gct      452
Arg Gly Arg Pro Pro Lys Gln Lys Thr Gln Ala Glu Ser Asp Ala Ala
100                 105                 110                 115

gct gct gct gtt gtt gct gcc acc gtc gtc tct aca gat ccg cct aga      500
Ala Ala Ala Val Val Ala Ala Thr Val Val Ser Thr Asp Pro Pro Arg
                120                 125                 130

tct cgt ggc cgt cca ccg aag ccg aaa gat cca tcg gag cct ccc cag      548
Ser Arg Gly Arg Pro Pro Lys Pro Lys Asp Pro Ser Glu Pro Pro Gln
            135                 140                 145

gag aag gtc att acc gga tct gga agg cca cga gga cga cca ccg aag      596
Glu Lys Val Ile Thr Gly Ser Gly Arg Pro Arg Gly Arg Pro Pro Lys
        150                 155                 160

aga ccg aga aca gat tcg gag acg gtt gct gcg ccg gaa ccg gca gct      644
Arg Pro Arg Thr Asp Ser Glu Thr Val Ala Ala Pro Glu Pro Ala Ala
    165                 170                 175

cag gcg aca ggt gag cgt agg gga cgt ggg aga cct ccg aag gtg aag      692
Gln Ala Thr Gly Glu Arg Arg Gly Arg Gly Arg Pro Pro Lys Val Lys
180                 185                 190                 195

ccg acg gtg gtt gct ccg gtt ggg tgc tga attaatcggt acttatgcaa        742
Pro Thr Val Val Ala Pro Val Gly Cys
                200
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tttcggaatc tttagttact gaaaaatgga atctcttaga gagtaagaga gtgctttaat 802

ttagcttaat tagatttatt tggatttctt tcagtatttg gattgtaaac tttagaattt 862

gtgtgtgtgt tgttgcttag tcctgagata agatataaca ttagcgactg tgtattatta 922

ttattactgc attgtgttat gtgaaacttt gttctcttgt tgaaaaaaaa aaaaaaaaaa 982

a 983

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Met Ala Phe Asp Leu His His Gly Ser Ala Ser Asp Thr His Ser Ser
1 5 10 15

Glu Leu Pro Ser Phe Ser Leu Pro Pro Tyr Pro Gln Met Ile Met Glu
20 25 30

Ala Ile Glu Ser Leu Asn Asp Lys Asn Gly Cys Asn Lys Thr Thr Ile
35 40 45

Ala Lys His Ile Glu Ser Thr Gln Gln Thr Leu Pro Pro Ser His Met
50 55 60

Thr Leu Leu Ser Tyr His Leu Asn Gln Met Lys Lys Thr Gly Gln Leu
65 70 75 80

Ile Met Val Lys Asn Asn Tyr Met Lys Pro Asp Pro Asp Ala Pro Pro
85 90 95

Lys Arg Gly Arg Gly Arg Pro Pro Lys Gln Lys Thr Gln Ala Glu Ser
100 105 110

Asp Ala Ala Ala Ala Ala Val Val Ala Ala Thr Val Val Ser Thr Asp
115 120 125

Pro Pro Arg Ser Arg Gly Arg Pro Pro Lys Pro Lys Asp Pro Ser Glu
130 135 140

Pro Pro Gln Glu Lys Val Ile Thr Gly Ser Gly Arg Pro Arg Gly Arg
145 150 155 160

Pro Pro Lys Arg Pro Arg Thr Asp Ser Glu Thr Val Ala Ala Pro Glu
165 170 175

Pro Ala Ala Gln Ala Thr Gly Glu Arg Arg Gly Arg Gly Arg Pro Pro
180 185 190

Lys Val Lys Pro Thr Val Val Ala Pro Val Gly Cys
195 200

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atg gac aac aaa aat gat cag gat att gat gtt aga tca gtg gtt gaa      48
Met Asp Asn Lys Asn Asp Gln Asp Ile Asp Val Arg Ser Val Val Glu
1               5                   10                  15

gct gtt tcc gcc gat ctt tcc ttt ggt gct ccc ctc tat gtg gtt gag      96
Ala Val Ser Ala Asp Leu Ser Phe Gly Ala Pro Leu Tyr Val Val Glu
            20                  25                  30

agc atg tgc atg cgc tgc caa gaa aat gga aca acc aga ttt cta ttg     144
Ser Met Cys Met Arg Cys Gln Glu Asn Gly Thr Thr Arg Phe Leu Leu
        35                  40                  45

acc tta att cct cac ttc aga aag gtc tta ata tct gca ttt gaa tgt     192
Thr Leu Ile Pro His Phe Arg Lys Val Leu Ile Ser Ala Phe Glu Cys
    50                  55                  60

ccg cat tgc ggg gaa agg aat aat gaa gtt cag ttc gca ggc gag att     240
Pro His Cys Gly Glu Arg Asn Asn Glu Val Gln Phe Ala Gly Glu Ile
65                  70                  75                  80

caa ccc cgt gga tgc tgt tac aat cta gag gtt cta gct ggt gat gtg     288
Gln Pro Arg Gly Cys Cys Tyr Asn Leu Glu Val Leu Ala Gly Asp Val
                85                  90                  95

aag ata ttt gac cgg caa gtt gtg aaa tct gaa tca gcc act att aag     336
Lys Ile Phe Asp Arg Gln Val Val Lys Ser Glu Ser Ala Thr Ile Lys
            100                 105                 110

att cct gaa ctg gat ttt gag att cca cca gag gcc caa cgt gga agt     384
Ile Pro Glu Leu Asp Phe Glu Ile Pro Pro Glu Ala Gln Arg Gly Ser
        115                 120                 125

ttg tct act gtg gaa ggg ata tta gca cgg gct gct gat gaa ctg agt     432
Leu Ser Thr Val Glu Gly Ile Leu Ala Arg Ala Ala Asp Glu Leu Ser
    130                 135                 140

gcc ctt caa gaa gaa cgc aag aaa gtt gat cct aaa act gct gaa gca     480
Ala Leu Gln Glu Glu Arg Lys Lys Val Asp Pro Lys Thr Ala Glu Ala
145                 150                 155                 160

ata gac caa ttc ttg tcc aaa ctg aga gct tgt gct aaa gca gag aca     528
Ile Asp Gln Phe Leu Ser Lys Leu Arg Ala Cys Ala Lys Ala Glu Thr
                165                 170                 175

tcc ttc acc ttc att ttg gat gat cct gct gga aac agt ttc att gag     576
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Ser Phe Thr Phe Ile Leu Asp Asp Pro Ala Gly Asn Ser Phe Ile Glu
            180                 185                 190

aac cca cat gct cca tca cca gat ccc tct cta acc atc aaa ttc tat      624
Asn Pro His Ala Pro Ser Pro Asp Pro Ser Leu Thr Ile Lys Phe Tyr
        195                 200                 205

gag cga aca cca gag caa caa gca aca ctt gga tat gtt gct aac cca      672
Glu Arg Thr Pro Glu Gln Gln Ala Thr Leu Gly Tyr Val Ala Asn Pro
    210                 215                 220

tct cag gct gga caa tca gaa gga agc ctt ggc gca cct gtg atg act      720
Ser Gln Ala Gly Gln Ser Glu Gly Ser Leu Gly Ala Pro Val Met Thr
225                 230                 235                 240

ttc cct tca act tgc gga gca tgt acg gag ccg tgt gag aca cgg atg      768
Phe Pro Ser Thr Cys Gly Ala Cys Thr Glu Pro Cys Glu Thr Arg Met
                245                 250                 255

ttc aaa ata gaa atc ccg tac ttt cag gaa gtt att gtc atg gca tct      816
Phe Lys Ile Glu Ile Pro Tyr Phe Gln Glu Val Ile Val Met Ala Ser
            260                 265                 270

aca tgt gac agt tgt ggc tat cgt aat tct gag ttg aag cct ggt ggt      864
Thr Cys Asp Ser Cys Gly Tyr Arg Asn Ser Glu Leu Lys Pro Gly Gly
        275                 280                 285

gca att cct gaa aag gga aag aag att act ctc tct gtg agg aac att      912
Ala Ile Pro Glu Lys Gly Lys Lys Ile Thr Leu Ser Val Arg Asn Ile
    290                 295                 300

aca gac ctt agc cga gat gtt atc aag tcg gac act gca gga gtg ata      960
Thr Asp Leu Ser Arg Asp Val Ile Lys Ser Asp Thr Ala Gly Val Ile
305                 310                 315                 320

atc cca gaa ctt gat ctg gag cta gct ggt ggt aca ctt ggt gga atg     1008
Ile Pro Glu Leu Asp Leu Glu Leu Ala Gly Gly Thr Leu Gly Gly Met
                325                 330                 335

gta aca aca gtt gaa ggg ttg gtt aca cag atc aga gaa agc cta gcg     1056
Val Thr Thr Val Glu Gly Leu Val Thr Gln Ile Arg Glu Ser Leu Ala
            340                 345                 350

aga gtt cac gga ttc act ttt ggt gat agt atg gaa gag agt aag ttg     1104
Arg Val His Gly Phe Thr Phe Gly Asp Ser Met Glu Glu Ser Lys Leu
        355                 360                 365

aac aaa tgg aga gaa ttt gga gcc agg ctc act aag ctc cta agc ttt     1152
Asn Lys Trp Arg Glu Phe Gly Ala Arg Leu Thr Lys Leu Leu Ser Phe
    370                 375                 380

gaa cag ccg tgg aca ttg att ctt gat gat gaa tta gca aat tcc ttt     1200
Glu Gln Pro Trp Thr Leu Ile Leu Asp Asp Glu Leu Ala Asn Ser Phe
385                 390                 395                 400

att gca cca gta aca gat gat atc aaa gat gac cat cag ctc aca ttt     1248
Ile Ala Pro Val Thr Asp Asp Ile Lys Asp Asp His Gln Leu Thr Phe
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                405                 410                 415

gaa gag tac gag agg tca tgg gat caa aac gag gag ttg ggt ctc aac     1296
Glu Glu Tyr Glu Arg Ser Trp Asp Gln Asn Glu Glu Leu Gly Leu Asn
            420                 425                 430

gac ata gat act tct tca gct gat gct gct tat gaa tcc aca gag acg     1344
Asp Ile Asp Thr Ser Ser Ala Asp Ala Ala Tyr Glu Ser Thr Glu Thr
        435                 440                 445

act aaa tta cct taa                                                 1359
Thr Lys Leu Pro
    450
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Met Asp Asn Lys Asn Asp Gln Asp Ile Asp Val Arg Ser Val Val Glu
1               5                   10                  15

Ala Val Ser Ala Asp Leu Ser Phe Gly Ala Pro Leu Tyr Val Val Glu
            20                  25                  30

Ser Met Cys Met Arg Cys Gln Glu Asn Gly Thr Thr Arg Phe Leu Leu
        35                  40                  45

Thr Leu Ile Pro His Phe Arg Lys Val Leu Ile Ser Ala Phe Glu Cys
    50                  55                  60

Pro His Cys Gly Glu Arg Asn Asn Glu Val Gln Phe Ala Gly Glu Ile
65                  70                  75                  80

Gln Pro Arg Gly Cys Cys Tyr Asn Leu Glu Val Leu Ala Gly Asp Val
                85                  90                  95

Lys Ile Phe Asp Arg Gln Val Val Lys Ser Glu Ser Ala Thr Ile Lys
            100                 105                 110

Ile Pro Glu Leu Asp Phe Glu Ile Pro Pro Glu Ala Gln Arg Gly Ser
        115                 120                 125

Leu Ser Thr Val Glu Gly Ile Leu Ala Arg Ala Ala Asp Glu Leu Ser
    130                 135                 140

Ala Leu Gln Glu Glu Arg Lys Lys Val Asp Pro Lys Thr Ala Glu Ala
145                 150                 155                 160
```

Ile Asp Gln Phe Leu Ser Lys Leu Arg Ala Cys Ala Lys Ala Glu Thr
165 170 175

Ser Phe Thr Phe Ile Leu Asp Asp Pro Ala Gly Asn Ser Phe Ile Glu
180 185 190

Asn Pro His Ala Pro Ser Pro Asp Pro Ser Leu Thr Ile Lys Phe Tyr
195 200 205

Glu Arg Thr Pro Glu Gln Gln Ala Thr Leu Gly Tyr Val Ala Asn Pro
210 215 220

Ser Gln Ala Gly Gln Ser Glu Gly Ser Leu Gly Ala Pro Val Met Thr
225 230 235 240

Phe Pro Ser Thr Cys Gly Ala Cys Thr Glu Pro Cys Glu Thr Arg Met
245 250 255

Phe Lys Ile Glu Ile Pro Tyr Phe Gln Glu Val Ile Val Met Ala Ser
260 265 270

Thr Cys Asp Ser Cys Gly Tyr Arg Asn Ser Glu Leu Lys Pro Gly Gly
275 280 285

Ala Ile Pro Glu Lys Gly Lys Lys Ile Thr Leu Ser Val Arg Asn Ile
290 295 300

Thr Asp Leu Ser Arg Asp Val Ile Lys Ser Asp Thr Ala Gly Val Ile
305 310 315 320

Ile Pro Glu Leu Asp Leu Glu Leu Ala Gly Gly Thr Leu Gly Gly Met
325 330 335

Val Thr Thr Val Glu Gly Leu Val Thr Gln Ile Arg Glu Ser Leu Ala
340 345 350

Arg Val His Gly Phe Thr Phe Gly Asp Ser Met Glu Glu Ser Lys Leu
355 360 365

Asn Lys Trp Arg Glu Phe Gly Ala Arg Leu Thr Lys Leu Leu Ser Phe
370 375 380

Glu Gln Pro Trp Thr Leu Ile Leu Asp Asp Glu Leu Ala Asn Ser Phe

385 390 395 400

Ile Ala Pro Val Thr Asp Asp Ile Lys Asp Asp His Gln Leu Thr Phe
405 410 415

Glu Glu Tyr Glu Arg Ser Trp Asp Gln Asn Glu Glu Leu Gly Leu Asn
420 425 430

Asp Ile Asp Thr Ser Ser Ala Asp Ala Ala Tyr Glu Ser Thr Glu Thr
435 440 445

Thr Lys Leu Pro
450

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